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ABSTRACT

This document describes a college-level curriculum for airplane pilots that is expected to be available at Muskegon (Michigan) College of Business and Technology in fall 1990. The curriculum offers associate or bachelor degree, college credit for earned flight ratings, private license, transfer credit for other aviation college programs, the possibility of an aviation minor with a business major, a business rather than engineering emphasis, the possibility of earning a basic flight instructor rating in 2 years or 4 years, general education core courses, and the possibility of earning both ground instructor and flight instructor ratings. In addition to a description of current pilot training and a literature review, the document describes the curriculum in terms of accreditation and general education requirements, the curriculum's philosophy, Federal Aviation Administration orientation, the kinds of students the curriculum is expected to attract, the employment orientation of the curriculum, an advisory board, and the scope and sequence of courses. The document includes 48 references and appendices that contain occupational information about piloting; a list of aviation programs; information on Muskegon College of Business and Technology; course descriptions; course fee information; degree requirements; questionnaires for identifying needs, potential employers, and advisory board members; and a list of pilot license requirements. (CML)

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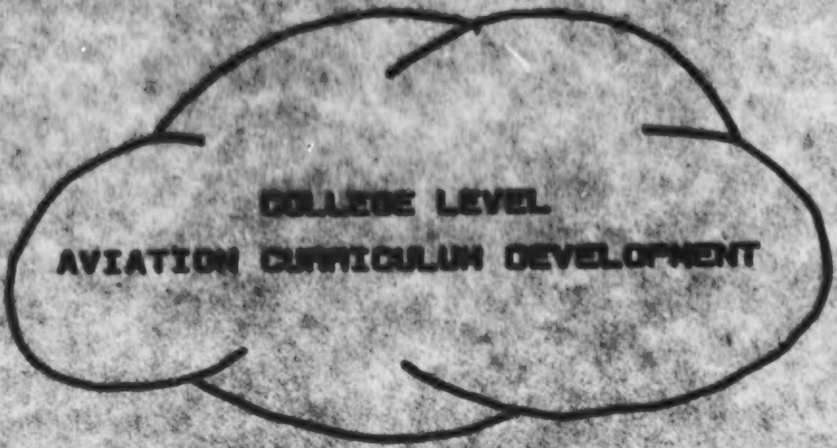

COLLEGE LEVEL
AVIATION CURRICULUM DEVELOPMENT

Betty J. Mattson

ED [illegible]

Practicum for Master's in Education

Grand Valley State University

Winter 1990

U.S. DEPARTMENT OF EDUCATION
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Chapter I

INTRODUCTION

Evidence indicates there will be a shortage of trained and qualified professional pilots in the future. The option of gaining this expensive training thru military service is being selected less and less by young people choosing this career field, and further reductions in total military strength brought about by recent world events, will probably further decrease these pilots. The Future Aviation Professionals Association (FAPA) has documented statistically the projected shortage and the growing job market in this field.(See Appendix A, B, C,). Further references to this include news articles (Lavin, 1989) , and personal comments from experts in the field, including Mary Creason of Grand Haven who recently retired from the Michigan Aeronautics Commission(MAC).

Pilot training can be a lengthy and expensive process. To work up to the level required to fly airline jets, requires several Federal Aviation Administration (FAA) pilot ratings and many hours of logged flight time. This projected critical shortage is not one that could easily be overcome with short term training.

Current Training Available

A survey of pilot training available reveals two general types: flight schools that prepare people for the FAA ratings; and actual colleges who give associate's and/or bachelor's degrees, along with the FAA rating preparation. The first type of training to be examined is the "flight school" concept.

Non-Degreed Training.

There are many flight schools in the West Michigan area, as well as the rest of the country. There are some inherent weaknesses in these programs. They do not offer college degrees of any kind. While many of them train excellent pilots who do pass the FAA requirements, those pilots are often stifled in their career moves by the lack of a degree.(Adults flock back, 1989)

There are four main reasons why a degree is helpful. First, a pilot may eventually want to move into a management level job, easier for anyone with a degree. Second, if s/he wants to move into a high level job with the airlines, degreed pilots are hired nine out of ten times (Lavin, 1989; FAPA, see Appendix C; Reider, 1989). Third, many employers find that a person who can fill dual roles is more usefull to them. For instance, a company may have a salesman and a charter pilot, but a single employee who can do both is more useful. He can fly himself to sales calls in distant cities and then, instead of waiting around the airport for several hours, go out and make those calls. Instead of two employees, the employer can get by with one and save on wages, while at the same time, actually paying that person more than he could pay each of two employees if he had to hire both the pilot and the sales person. To fill dual roles requires a licensed pilot to also have other employable skills, often either in a business or technical area.

The fourth reason why non-degreed pilots are at a disadvantage is because of the nature of flying itself. Pilots work long erratic hours and are often away from home base several days at a time. If life style changes, such as becoming a single parent, make this work schedule untenable, the pilot may want to transition into a "ground job" which again requires skills and education other than mere flying. The other thing that can "ground" a pilot is losing his FAA medical certificate. Many common medications, such as antihistamines, deny a medical. The person may still be basically healthy and employable, but unable to fly. In this situation, a "ground" job again becomes a necessity and additional education a real value. If the prospective pilot earns his degree early and then must seek other employment later in his career, it may be easier than "re-training" in mid-life when he has family and financial obligations that may make returning to school full time unfeasible.

One such non-degreed flight school that has received a great deal of publicity recently is the Aerospace Flight Training Academy (AFTA), located at Kent County International Airport. (See McClellan, 1989) This school claims to train pilots for the airlines by using their hiring criteria in accepting students. They also claim to have a large battery of planes available for training. In reality, according to aviation insiders, such as Leonard Parmley, Chief of the FAA Control Tower at Muskegon, they have one "one ratty little Cessna." Such programs as this, however, might be ideal for a person who already has a bachelor's degree in something and now wants to pursue an aviation career.

It appears that a curriculum that is offered by an established and accredited college that is empowered to grant a degree, either associate's or preferably, a bachelor's, can provide a more solid basis for employability in the long run in this career field.

Next, let's examine these programs.

Degreed Flight Training

To begin this program examination, I used the FAA publication List of Certificated Pilot Schools (7-10-87) and Michigan Aeronautics Commission's (MAC) College/University Aviation Programs (See Appendix D) to obtain the names and addresses of colleges in the mid-west which offer such programs. I chose 17 from Michigan, Ohio, Indiana, and Ilinois with the thought that I might later visit some of them for further comparison research. After obtaining catalogs from most of those I contacted, I further narrowed my specific research on curricula down to four: Northwestern Michigan College (NWC) in Traverse City; Lansing Community College (LCC) in Lansing; Western Michigan University (WMU) in Kalamazoo; and Andrews University (AU) in Berrien Springs. These were selected because many west Michigan area students are going to these institutions, because they are the closest, and offer both associate's and bachelor's programs. Obtaining detailed information can be difficult, altho when requesting facts from them, I have stated I need this for my own master's practicum research, they are justifiably suspicious and reluctant to provide information to possible "competition." Additional information on college aviation curricula in general was garnered from College Aviation Accreditation Guidelines (Kitely, 1976) published by the University Aviation Association.

While my original intent was to develop a local area curriculum, which would offer an additional educational institution to meet the growing demand for degree trained pilots, I soon discovered many weaknesses in the curricula of existing programs. First I will explain the need for a "local school", then detail these weaknesses.

Flight training is expensive. It can be compared to becoming a medical doctor. Most people have financial backing or go heavily into debt. Since the earning potential ($90,000 per year for some airline captains) is so great, many future pilots take this risk. However, anything that can mitigate this expense is an advantage. Expenses include tuition, books and supplies, living expenses, and with these programs, flight fees, usually in excess of $10,000 total. Other major subject areas don't have this tremendous "lab fee" expense. One way to hold down total costs is with living expenses. If a student must live in a dorm, away from home, this will be costly. Students who can live "at home" with parents, or in their already established home areas, where they may have an employed spouse or other living arrangement, can get by cheaper than those living in dorms. Until now, this has not been possible in the Grand Rapids-Muskegon area. Even tho this geographical area is producing a bumper crop of college students (Tinney, 1989) there is no flight training at a college where a person could reasonably be expected to commute.

Another consideration of a school's location is its proximity to controlled airspace. NWC is located far from "controlled airspace", in which students need to log a fair amount of their flight training time. Flying to this airspace increases total time needed and is often "wasted" training time. The Grand Rapids-Muskegon area is close to many different controlled airspaces.

Deficiencies that exist in current curricula include those that don't consider either the needs of the fresh high school graduate who needs to begin "at the beginning" and would like to be guided initially (older adults may be less affected by this lack) or the return-for-a-degree pilot who already has several pilot ratings and now needs to earn the college credits for the actual degree.

WMU starts students with the instrument rating. While it includes private pilot ground school in its catalog, this does not apply to the degree. A student must have his private pilot license completed before he can begin his flight training there. This means he must locate a suitable training site, probably a private flight school. Many high school students find this difficult. I have had several in the private pilot ground school classes I have taught and four out of five did not pass the written exam, altho my adult "pass the exam" rate is 34 passed out of 38. I believe it is an overload for these high school students, on top of their other courses and at their level of maturity. Several of them have expressed to me verbally that they would prefer a school that would start them at the beginning. Leonard Parmley is of the opinion that this policy followed at WMU is a hold over from the previous Veterans' Administration regulations. Because a private pilot license by itself does not make a person employable, the VA would only fund advanced ratings.

At the other end of the scale, are the licensed pilots who find all their many ratings and experience count for nothing when they apply to WMU. The idea of College Level Examination Programs (CLEP) to earn credits has apparently never caught up with this field. Again I have heard verbal complaints that people felt stifled because of this.

Some college programs, while granting an associate's degree, offer little in the way of general education. Lansing Community College has only one course required besides the flying and that is American Government. The actual usefulness of the non-aviation courses at most of these schools is doubtful. While they may give a person more engineering knowledge of aerodynamics or engines, they give little practical experience. Business skills are largely ignored. WMU begins flight training in the junior year and students may spend two years on general education classes that offer little in the way of employability skills. By the time they get into the "meat" of their career program, many of them have lost interest or dropped out of school altogether. Another factor is what constitutes completion of an individual course. The FAA has set requirements for pilot ratings that must be met. These include passing FAA written tests and FAA flight checks. To be eligible for the flight check, a pilot must have logged a specific number of flight hours under certain conditions, i.e. night flight, cross country flight, pilot in command, instrument, etc. Sometimes hours required for one rating may also be used toward total hours required for another rating. To obtain a commercial pilot rating, a person must have logged a total of 250 hours of flight time. Many of these hours will also have been applied to the instrument rating and may be applied to "type" ratings in multi-engine, seaplane, etc. (Federal Aviation Regulations (FAR) 1989) A planned program can take this into consideration and "piggyback" hours to gain the most use from them. This can hold total flight costs down. There are also legal limits (FAR) on the number of hours that may be "flown" in a flight simulator for some ratings. Some schools maximize these hours. In fact some schools, altho not of the four I chose to evaluate specifically, offer only simulator training and force their students to get all their actual aircraft time elsewhere! It is not unusual for schools to state in their catalogs (WMU and LCC) that simulator classes can be signed up for any semester, but there is a waiting list for aircraft classes. Some schools (WMU, NWC) lump flight training into "Commercial Flight" classes. Students go along for the semester and log time toward all the ratings they will get, but often don't complete any ratings for a long time, if ever. WMU (Sackett, 1989) does not specifically prepare its students for the FAA written exams. That is the student's own responsibility. FAA ratings alone should not be the only criteria for course completion according to UAA (Kitely 1976), but they are a reality professional aviators live with throughout their careers. New ratings will be invented as new aircraft are invented. Establishing a good attitude and analysis of the test situation early in their careers could be a good start for future professional pilots.

While no school is "perfect", none has all the failings either. Andrews University seems to offer the greatest versatility to students and even includes airframe and powerplant mechanic certification and avionics training in its catalog. However, this is a religious school, which specializes in training missionary pilots. Students who aren't interested in the religion aspect might find themselves spending a lot of tuition money, time, and effort on these "extras."

The New Curriculum

The curriculum I propose to develop will address these needs and hopefully, compensate for some of the deficiencies in currently existing programs. More specifically, it will be located in Muskegon; utilize FAA written tests and flight checks as terminations of courses; offer students flexibility of total programming for beginners or transfer "credits" for previously earned flight ratings; offer maximum employability, both thru employer input and business and general education classes; balance use of flight simulator time; allow either an associate's or bachelor's and because of this, place flight training at the beginning and general education at the end of the bachelor's.

The first phase was to locate a suitable, already accredited institution that could offer the curriculum after it was developed. For this I chose Muskegon College of Business and Technology (MCBT). My first contact there has been Bernard Tobin, Dean of the Business/Technical Division. His input on their criteria is hence reflected in my curriculum. This institution was chosen because it is located in Muskegon and for its employment oriented philosophy (MCBT catalog, 1990).

Muskegon appears an ideal location for a new training facility in this region. People can commute from north, the Whitehall-Hart area, from the Grand Rapids area, from Grand Haven and Holland. There are a lot of potential college students in this region, which is served by over 60 high schools.(Tinney, 1989) The airport facility there is also ideal. Grand Rapids already has two fairly large flight schools (AFTA and AMR Combs) located at its airport. This large airport has many airline jets landing and taking off daily. While operating out of a control tower airport is good training for the beginning student, competing with airliners for runway use can be a detriment. There is the consideration of the "wake" of air when large planes land and take off. There is also more "wait" time to use a runway in this situation. This time is logged on the "hobs meter" in the aircraft and increases costs of training time, while little actual learning takes place during these waits. Muskegon has a control tower with a fully operational instrument landing system. According to the Tower Chief there, Leonard Parmley, many students from the Grand Rapids schools fly to Muskegon Airport to gain experience in instrument landing. Both Parmley and Muskegon Airport Manager Terry Gravious are encouraging the establishment of a college training program located at their facility. Their cooperation and support may be useful in the actual development of the program.

Since I am not myself a flight instructor, I needed input from someone who is. Also, it seems most feasible for a flight school to contract out to an established flight school to supply the actual flight training, at least initially. An additional advantage to this is the liability and worker's compensation insurance costs. A school with a good rating receives much lower insurance rates than a new facility would. This idea is supported by the UAA (Kitely, 1976). To this end I have contacted Gary Vander Veen who is in charge of flight training at Tulip City Air Service. His input is included in the flight portions of the curriculum I have developed.

We have chosen to develop a plan that offers FAA written tests and flight checks as the termination point of most classes. This is contrary to the way WMU has set up its program, but is similar to LCC and AU. Several aviation experts(Gary Vander Veen, Leonard Parmley, Paul Derr) have verbally agreed with me that this is appropriate. Students will be prepared specifically to pass the tests and ideally to aspire to standards hirer than merely passing. They will be living with these tests all their professional lives and establishing good attitudes towards them now is part of our organic curriculum. Also this offers a "clean" method of determining when a class has been completed. Solo is required for beginning flight; at this point credit for the class is granted. It may take a student six, or maybe 25, hours of actual flight time to reach the proficiency level where the instructor is willing to "sign off" for solo. Ground school classes will be passed when the FAA written exam is passed. Most flight classes have passing the FAA flight check as the final point.

My curriculum begins with private pilot ground school and beginning flight. We would like to get people in the beginning of their training, before they have had a chance to establish any bad habits. Also it removes the burden of getting training elsewhere. On the other end, we plan greatest flexibility. A real advantage to MCBT over other colleges is that it already recognizes transfer students with life experience and officials there are very willing to consider adopting a program that will allow actual credits for earned ratings. The MCBT catalog (1990) states a policy of a minimum of 48 term credits earned at that institution for the granting of a degree from there. A student with several flight ratings could earn as much as 48 credits for those ratings. Vander Veen and I have planned a "renewal" course of one to three credits to evaluate previous ratings. This philosophy is in line with that expressed by UAA (Kitely, 1976). With additional previously earned credits from other colleges, a person could feasibly earn a BBA in a year. This may enable some experienced pilots to move up the "career ladder" into higher level jobs.

Along similar philosophical lines, my program will stress maximum employability of its graduates. Again, this philosophy is stated in the MCBT catalog. For over 100 years this school has been preparing people to go to work: as legal secretaries, as accountants, and more recently, as surgical technicians, CAD/CAM operators, and electronics technicians. This curriculum will place the emphasis on business in the BAA program, with accounting, finance, management, personnel, etc., similar to that already laid out in their industrial management program. On the associate's level, students will get introduction to business, computers, math, and several communication courses including composition, technical writing, speaking, and communication. Some FAA tests may be administered by computers (Anderson, 1982; Federico, 1989; McDaniel, 1982;) so computer literacy will be useful for this, as well as on large jets used by airliners. The main difference between a college trained pilot and a flight school trained pilot is the literacy level and public communication, rather than flying ability. Both levels recognize the need for good "people" skills and will include psychology. Employer input as to what they like in graduates has long been a part of MCBT's procedure in developing new programs. Jay (1982) also documents this as a procedure. An outline to obtain detailed input will be included in my final proposal to the college, altho I have already queried some employers for general ideas. Pearson (1989) is another reference on this aspect.

Much research that has been done on flight training was accomplished in a military setting. There are several references that describe the usefulness of flight simulators, both to save costs and time (Thomson, 1988; Thode, 1983; Sorensen, 1983; Richards, 1982; Pieper, 1984; Owen, 1987). This curriculum will attempt to balance what is optimal for effectiveness with cost savings for students. To this end, much input will be made by Vander Veen and Tobin, however the final product will be in line with the FAR's and hopefully, the above mentioned research documents as well.

Since we will offer either an associate's or a bachelor's degree, the curriculum will begin with the flight and some general education basics and the most of the business and general education will occur during the last two years of the bachelor's. It is believed this will keep student interest and motivation high. Also, if a student is unable to complete the bachelor's, s/he will at least get the basic flight training and will be employable, altho not as versatile or promotable as will be those who can complete the bachelor's. With this arrangement, a life-long learning plan could be put into place. Sometimes economics force students to terminate their full time education before completion. At least with this curriculum, they should find jobs in their chosen field (aviation)!

The actual overall course descriptions and rotation schedule for the associate's and bachelor's will be developed. As previously stated, much input will be made by both Tobin and Vander Veen, so the final product will be acceptable to the North Central Accreditation team and practical from a flight instructor standpoint. It will also have academic validity based on research and should enable this new program to be competitive with those already in existence and begin to train future professional pilots to alleviate the projected shortage.

Chapter II

LITERATURE REVIEW

In reviewing the literature, I divided it into three general areas: (a)educational psychology and school curriculum development,(b) adult education on a college level for employment purposes, and (c) specific aviation education.

It seems these are two distinct educational areas. Aviation education consists of actual flight training, and the "ground school" courses that are specifically related. There is not a lot of literature on this topic and much of what there is was done in a military setting. In reviewing this, I tried to make the distinction between research that would have only a military application, such as shooting down a target, and that which might transfer to civilian flight training, such as training time needed to reach proficiency in flight. Articles that appeared to have only a military application were discarded without further review and are not reported on here.

On the general education theme, there are several sub topics, however one article frequently addresses more than one issue. For the sake of organization, I divided these into: (a) adult education techniques, (b) education level/degree need, (c) integration of general and technical education within a single program, and (d) career education for employment.

The aviation education is separated into: (a) general aviation education and (b) use of flight simulators and/or computers in aviation education.

Educational psychology includes (a) text on learning conditions and techniques of instruction; and (b) school curriculum development in a brief review of techniques learned in previous courses.

Psychological Component

Educational Psychology

Gagne' (1985) lists the major categories of learned capabilities as: "Intellectual Skills: discrimination, concrete concept, defined concept, rule, and higher-order rule; Cognitive Strategy; Verbal Information; Motor Skill; and Attitude. (p. 67)

Regarding learning motor skills he describes combining part-skills into skilled procedures, "When one says to a novice driver, 'Now start the engine,' one is asking for the execution of a learned behavior chain containing several component skills. If the training of the driver has been successful, what will take place is the reinstatement of a sequence something like this: start the engine, looking forward and to the rear, sight of clear road, testing for gear in neutral, gear in neutral, turning key to activate starter, sound of motor catching, release of key, key released, depressing accelerator. Each of the individual acts in the chain is something that the learner knows how to do. What must be learned is to get them done in the proper order."

He continues with conditions for learning motor skills: 1. Early, or Cognitive, Phase. 2. Intermediate, or Associative, Phase. and 3. Final or Autonomous, Phase. (pg. 212).

In the early phase, the student must understand and think through what he is doing. In the Intermediate phase, part-skills become smooth and timed, unitary skills that are integrated in to total skills. In the final or autonomous phase, "The motor skill becomes less subject to interference from other ongoing activities. The procedural steps no longer need to be initiated by cues supplied by the learner; that is, the learner no longer needs to 'think what of to do next.'" This skill level "can be executed while the individual is engaged in other activities (such a conversing or solving intellectual puzzles.)"

Gagne' describes the internal conditions needed as recall of part-skills, and then recall of executive routine. External conditions include verbal instructions, pictures, demonstrations, and practice, followed by feedback.

He describes teaching methods for teaching attitudes as classical conditioning, reinforcement (including self-reinforcement) and human modeling. Human modeling (p. 232) "One of the most dependable sets of events that has been found to produce changes in attitudes is the phenomenon of human modeling. In these circumstances, learning results in imitation of the model's behavior, or more precisely, in imitation of action choices."

He continues, "The many studies of behavior modeling and attitude change through human modeling suggest that human beings play an essential role in the conditions for effective learning of attitudes." (p. 233)

Internal conditions for learning attitudes include concepts and information. External conditions include observation of the human models's choices, variations on the human modeling them, reinforcement of action choice.

He details: "The events that result in learning from human modeling occur in approximately the folowing order: 1. The model's appeal and credibility is established. . . 2. The learner's recall of the object of the attitude and the situations to which it is applicable is stimulated. . . . 3. The model demonstrates or communicates the desired choice of personal action. . . 4. A demonstration or communication indicates a reinforcing state of affairs for the model."

In summary, all five of Gagne's capabilities will be taught in one phase or another of any comprehensive curriculum(including mine). Different teaching methods will be needed for the various components.

Mayer (1989) discusses using models in teaching. He wanted to improve recall of conceptual information while decreasing verbatim retention and increasing creative solutions. To do this, he conducted several experiments by giving students models for one minute prior to a lesson and not letting the "control group" see the models. The models used included: radar, Ohm's law, density, data base, BASIC, Nitrogen cycle, camera, and brakes. Most of them were variations of a flow chart. This was a model prior to a lesson. He also conducted experiments of using models within the lesson. Results showed conceptual recall increased an average of 57%; verbatim retention decreased 14%; and problem solving transfer increased 64%.

He went on to list the characteristics of a "good model" as being complete, concise, coherent, concrete, conceptual, correct and considerate. A complete model contains "all of the essential parts, states, or actions of the system as well as the essential relations among them, so that the learner can be able to see how the system works."

He states that concise models "are presented at a level of detail that is appropriate for the learner. Rather than provide so much detail that the student is overwhelmed, good models summarize and epitomize the system they seek to explain. Rather than provide a 'blood and guts' description of each part, good models describe the general functions of each part."

He continues to explain when and where models should be used: "In the foregoing review, models were effective for explanative material, that is material that explained how some system worked. Correspondingly, visual mnemonic techniques have been shown to be highly effective for helping students to remember rote lists and paired associates. . . Several of the studies in the foregoing review provided evidence that models are effective when placed either before or integrated within a lesson, but not when placed after a lesson."

Finally, he summarizes: "When the goal of instruction is student understanding of potenially meaningful explanations, conceptual models can be effective tools . . the results of this review encourage continued development of theory and practice for for using models to promote understanding. One particularly exciting avenue concerns the role of interactive computer graphic simulations as a vehicle for expanding the power of conceptual models."

Mayer's good models summarize and simplify a complicated subject, enabling students to organize their thoughts and projected memorization of the subject under discussion. Ideally the models are viewed prior to attending the lecture or learning activitiy, before the student has already "organized" the factual material in some other manner.

Curriculum Development

Oliva (1988) gives models for developing curriculum in school systems. On page 171 he quotes Ralph W. Tyler, Basic Principles of Curriculum and Instruction (1949) which is a classic in the field and difficult to obtain. The model begins with sources of Student, Society, and Subject, and then moves to tentative general objectives. This is routed through Philosophy of Education and Psychology of Learning to Precise Instructional Objectives. From here he moves on to: selection of learning experiences, organization of learning experiences, direction of learning experiences, and evaluation of learning experiences.

Oliva developed his own model on page 175. He begins with the specification of needs of students in general and of society, which feeds into a "statement of aims and philosophy of eduction, including beliefs about learning." From there he moves through the processes of needs of students, community, and subject to curriculum goals. He then moves on to objectives and organization. The next stage involves instructional goals (which are different from curricular goals), and objectives, strategies, evaluation techniques, implementation, final evaluation and evaluation of instruction.

Glatthorn (1987) displays similar models in his concise work, Curriculum Renewal. He recommends establishing a task force of teachers and administrators for input. He doesn't recommend that one "expert" develop a final curriculum for a school district. He also describes the academic and organic curriculums and the importance of both being included initially in the pre-planning phase. Goals and subgoals need to be agreed upon and then responsibility assigned to the various departments and/or classes. This occurs before scope and sequence or units of study are discussed. Then text possibilities, state guidelines, etc. are considered. He suggests examining "exemplary curriculum guides from other school districts" at this stage of development.

Glatthorn also addresses the issue of improving a program at a given level. He lists as criteria: "A sound program of studies is goal oriented, balanced, integrated, skills reinforced, open ended, and responsive.

He details some of these on pages 53-55. "A Sound Program of Studies is Skills Reinforced. The skills required for learning in many subject areas (writing to learn, reading in the content areas, critical thinking, and learning and studying skills) are given appropriate and timely emphasis. In a sound program of studies, separate sujects are strongly laced together with the key learning skills that cut across disciplines: All of the skills required for learning in many areas are given appropriate and timely emphasis."

He continues, "**A Sound Program of Studies is Open Ended.** The program of studies gives all students the knowledge and skills they may need for future success: Students are not tracked into dead end programs on the basis of premature career choices.. . . Regardless of how students find themselves in different career tracks, the research strongly suggests that there are some serious problems with such tracking. . . The specilized vocational and college preparatory curriculums do not appear to be providing effective preparation."

Glatthorn repeatedly urges the use of survey forms to gather data for decision making in curriculum development.

Both Glatthorn and Oliva stress the importance of multiple source input, such as a "task force", in developing curricula. A good curriculum is not the opinion of one person, but the input of many. Goals should be established first, then the objectives and finally the teaching methods and materials. Their programs, however, are designed to be utilized in established school systems below the college level. Organizing a "task force" in developing a new curriculum for a school that doesn't already have it, is not always feasible.

General Adult Education

Adult Education Techniques

Two articles specifically addressed the concerns of adults, Lightner, 1984; and Harmon, 1987. They reviewed well known factors of adult education (i.e. activating previous knowledge, immediate application need, time demands, etc.) and specifically mentioned the need for convenient hours and locations of training. Also mentioned was the need for remedial work and study skills improvement, which I believe some trained flight instructors and pilots may need if they are returning to school for the general education component, especially if they have been away from formal education for several years. Market research to determine the needs of potential clients was suggested.

Education Level/Degree Need

There is not much literature available on the need for a college degree in the aviation profession. Interviews with non-degreed pilots have indicated many of them feel "held back" by the lack of a degree, in spite of many flight ratings and logged flight hours. The only reference I located that specifically discusses college degrees for pilots is Finding the best flight instruction (Reider, 1989). This video cassette was produced by Sporty's Academy, which produces and markets much aviation education material to pilots and others involved in the aviation field. I got a copy primarily so I would know what others were being told. However, in listening to it, there is some material that is recent enough to be interesting as research. The tape, which runs 85 minutes, is done in a format of interviews with various aviation professionals. Two of them specifically address the issue of college training.

Professor Stacy Weislogel, Chairman of the Dept. of Aviation at Ohio State University, states the general education of a degree program, as well as participating in a professionally managed aviation program over the several years it takes to earn a college degree, produce better professional pilots. He claims, "The more forward thinking airlines, looking for people with potential to be flight managers as well as pilots, for a well rounded 20 to 30 year career," will choose the college graduate pilot.

Another person interviewed on this topic is Judy Tarver, a "cockpit recruiter for a major airline." (They don't specify which airline.) She states:

> We certainly prefer an aviation degree because that means they're starting their flying career sooner. We know that the universities try to stay abreast of what's going on in aviation industry, so they likely gear their programs toward the ultimate goal of working for a major corporation or major commercial airline. We like the fact they have an

aviation degree.

She goes on to state that without an aviation degree, whatever flying they do after college is scrutinized for quality and amount and considered. She doesn't mention the possibility of hiring someone without a college degree.

The Bureau of Labor Statistics (1984) report, Educational Attainment of Workers, states in 1970, one in seven adult workers had completed college, by 1984, it was one in four.

Two other articles addressed the advantages of a college degree in the general labor market. Romano (1985) does a comparison of community college associate's degrees, bachelor's degrees, and high school only. He breaks it down into three paths: A, go to work; B, get a 2-year degree; or C, get a 4-year degree. According to him, Path A promises $20,000 per year for 21 years; Path B promises $24,000 per year for 21 years, and Path C, $32,000 per year for 21 years. He does comment that a 2-year degree is closer to those with only a high school diploma in earning potential, than it is to those with a 4 year degree.

Henderson and Ottinger (1985) published a comprehensive article "College Degrees . . still a ladder to success?" They state:

> "A college degree remains a good investment. College graduates have increased job opportunities and a lower probability of unemployment . . . Job seekers can increase their chances of finding a good job by researching the job market to find out what the forecasters predict about specific fields, by sharpening their communication skills, and by getting actual work experience while in college."

Henderson and Ottinger also compare lifetime earnings and level of education. According to their statistics, male high school graduates earn from $860,000 to $1,870,000 in a lifetime, while four-year college graduates earn from $1,200,000 to $2,750,000. They further state, "a college education may repay the actual costs of schooling, as well as the wages lost by not working during the college years."

As to types of employment that are most promising, they state, "Most of the additional 25.2 million new jobs that will be generated between 1982 and 1995 will be in service-producing industries. Specifically, almost three-fourths of the new jobs should be in transportation; ..."Aviation is a service business. And it certainly is in "transportation."

They conclude by stating, "in 1970, 13 percent of the adult labor force had college degrees; in just 13 years, the figure was 20 percent."

It appears that the value of a college degree, both in lifetime earning potential, job type, and job satisfaction, has been verified in the literature.

Integration of General and Technical Education in College Programs

Miller and Clark (1983) address this issue, along with career training for a goal of employment and their comprehensive article will be discussed in detail in the next section.

Two articles address the issue of writing skills for people being trained in non-writing professions. May and Arevalo (1983) discuss writing for accountants. Specifically, writing for a "specific purpose". This is done in a three course sequence where students write a total of eight papers, tasks encountered by professional accountants. A full-time writing consultant on the school's staff provides lectures, handouts and individual assistance. Faculty evaluation determined that the students' writing is improving.

Engineering Practices Introductory Course Sequence is discussed by Olds (1987). EPICS is mentioned in other literature as well. This includes technical writing, oral communication, computing, and graphics and mapping, covered over four semesters for a total of 11 credits.

Pavelich (1984) discusses the development of an EPICS program for the following reasons: "Technical competence, effective communication skills, life-long learning skills, creative approach to problem solving, breadth of interests, and professional and ethical behavior." As a preliminary evaulation of the program's start, he states, "The faculty believe that the EPICS students equal or surpass the skill levels achieved in core subjects by students in the traditional courses, particularly in computer usage and technical writing. The sophomore-project clients have stated that the students' ability to communicate problem solutions is clearly better than that of most recent graduates in industry."

Pearson (1989) also incorporated the EPICS philosophy in his training program for industrial engineers at Rolls-Royce in England.

EPICS is an interdisciplinary approach to curricular development that has been used in technical training from company in-service to academic programs. The idea behind EPICS is to integrate the five areas into one series of courses, instead of using separate courses, such as English, computer science, speech, mapping, etc. All combined emphasize problem solving using the skills from these various disciplines.

Clearly writing and other communication skills are highly valued and need to be incorporated into technical training areas.

Career Education for Employment

Jay and Gose (1982) conducted a needs assessment for a gunsmithing program at community college. They surveyed 224 professional gunsmiths with questions as to the appropriate ratio of class time to lab time, on-the-job-training, salary information, total hours of the program. The results of the survey were used in changing the existing curriculum and in recruiting. Increases in enrollments resulted from the implementation of the survey results.

The growth of the "service industry" is again addressed by Norwood (1988) in her Competition and Competence: Employment Trends for the 1990's. She predicts growth in telecommunications, gasoline, and air transportation. She further claims that one out of three jobs in the service industry is a professional specialty. While current service employment is only 30% of total employment, it represents 75% of professional employment! As more evidence on this comes to light, claiming to be part of the burgeoning "service industry" may become more acceptable. Aviation is a service business.

Miller and Clark (1983) have a lengthy paper, Planning and

Managing Technology Programs: A Challenge to Higher Education. This article covers aspects of several of my topic breakdowns and appears to provide justification for several of the philosophies of my curriculum.

They address the issue of accreditation based on issuing licenses to educational institutions, professional associations, and federal government requirements. With MCBT we have an accredited institution of higher learning qualified to issue both associate's and bachelor's degrees. We will also be integrating Federal Aviation Administration requirements for various pilot ratings.

While discussing employers' needs to meet labor needs, they say, "The time lag between technological innovation and commercial applications used to be 10 to 15 years and is now three to four years. ...Specialized degrees in higher education reflect the rise of occupations which require formal instruction to meet the needs of a more technologically complex economic structure."

They further state, "The role of degree-based higher education in addressing the need for a higher level of technically-trained personnel, to serve society in varied occupations, is emerging quickly as an important factor in job placement. In coordinating higher education with relevant employment needs of society, some of the major issues confronting educators and economic planners are as follows: . . . 3. Relationship of liberal arts preparation to preparation for direct employment . . .7. Higher education's capability to provide private sector, occupation-specific education."

They discuss at length the role of public higher education in this view.They also have a large section on "Proprietary Postsecondary Education." This they describe as "outside the degree offerings of traditional forms of higher education. . . Current changes in public acceptance of proprietary education are heightening interest in what proprietary schools can do and are doing. Students . . . are able to meet the requirements for job entry in a specific occupation and in a limited period of time." This does generally describe what we will be doing. Such private schools seem to be able to move quicker in adopting new programs than the public education institutions are. Miller and Clark state, "Such education frequently is characterized as single-purpose, human-capital-creating preparation. Proprietary education is able to respond quickly to changes in manpower needs ... by developing the curriculum from the market place, thus enabling students to fulfill employer-defined needs."

Some issues they raise regarding such proprietary technical education include: "2. Relationship of job requirements to certificate and degree requirements." "3. Role of job-oriented education in preparing students for long range work needs." "4. Accuracy of labor market forecasting.""5. Society's responsibility to finance the cost of instruction for specific career occupations."

In summary, Miller and Clark state, "New products, innovative processes, and novel solutions enable society to master its environment and to enhance human potential. . . As technological advancements increase and as higher education attempts to fulfill social and economic needs, higher education is being asked to alter its programmatic objectives and offerings at a pace which does not allow for leisurely adjustment."

This section seems to be in agreement that a "needs assessment" of potential future employers is a good basis for developing a program. Other advantages are to meet requirements of acreditation and recognize this is a "service" industry and that aspect should not be buried totally under the more technical issues that must be included in a curriculum.

Specific Aviation Education

General Aviation Education

The first article I reviewed is An Evaluation of Minority and Female Performance in Army Rotary Wing Aviation Training. (Brown, 1980) Altho this military research is not in an aviation area (rotary wing) that will be included in my curriculum initially, the fact that the results address minorities and females, rather than aircraft performance per se, caused me to include it in my literature review.

Black, Hispanic, Asian, American Indian and females were compared with "control groups" (presumably white males) on areas of learning including flight performance and overall grade. The only significant difference shown was the "Black group during the primary stage of training ; the academic grade average for Blacks was significantly lower. There were no significant differences in flight performance grades or in overall program grade. The Hispanic group was the only group to show significantly more recycles (i.e., repetition of a stage of training). . . During flight training, only Blacks and Hispanics had significantly more recycles than did their matched majority groups."

It appears there would be no differences in expectations during the actual flight training phase of an aviation college program. However, one should be alert to possible difficulty in academic areas of minorities, especially those who may not have been encouraged to pursue excellence on a secondary level.

Kreinkamp (1983) addressed the issue of personality matches between flight instructors and student pilots in his master's thesis. For this he used the Myers-Briggs Type Indicator personality test. Being familiar with this (I am an INFJ), I found this article interesting, but probably not relevant to my curriculum development. His problem was getting the MBTI results on enough people for a study. While he began with 100 student pilots, he was only able to use 32 in the final data, because of inability to gain test results on all students and instructors. The concept of matching students and instructors is a valid one, however, and is discussed by Weil (1982) as well. The major conclusions of the study were:

> 1)The extravert-intovert differences between male student pilots and their flight instructors compared with student pilot flight training time was statistically significant. Differences on the sensing-intuitive, thinking-feeling, and judging-perceiving scales were not statistically significant. This result suggests that if male student pilots are paired with their prospective flight instructors based on the proximity of their scores on the Extravert-Introvert scale of

the MBTI, the student pilots can expect lower phase 27 times than if they were not matched. ...

2) On the basis of sex, male's extravert-introvert difference scores were statistically significant while female's scores were not. All other difference scores for males and females were not significant.

The results of this study present some support for the assertion that personality type and perceptive style are influential in the acquisition of flying skills. It is, however, quite possible that any number of mediating variable, not controlled for in this study, may have been operating.

It appears the actual sample size was very small (32 pairs of instructors/students). If male students are paired , as much as possible, with instructors who are similar in the intravert-extrovert scale, they may be more successful in completing flight training with fewer "recycles".

Weil (1983) addresses this as well as other aspects of flight training in "Learning to Fly". She covers FBO (Fixed Base Operator) free-lance flight instructors, flight schools and flying camps. Very little is said about college level training; it is lumped together with other "flight schools." She also discusses trainer aircraft and states "75 per cent of all student pilots train in the (Cesna) 152.."Her costs estimates are, of course, out of date for 1990.

Regarding the student-instructor relationship, she states, "Besides your own determination, your flight instructor is the single most important factor in your flying career. He will teach you habits that can stay with you for the rest of your airborne days--so they had better be good ones."

Schlenker (1985) has a Private Pilot Ground School Course. Instructor's Guide. He breaks down the topics with objectives, goals, etc. as a formal college syllabus should be written.

Probably the most useful and interesting aviation article I located was one that ERIC did not identify as "flight training", its descriptor and since it wouldn't accept "aviation" as a topic, I wouldn't have even got this article if I hadn't asked for "technical education-college level" The document by Hixson (1982) was Current Status of the General College's Career Development Programs. This discusses seven different specific programs including one section on "aviation" which was written by Fredric Steinhauser, Coordinator of the Aviation program at General College at the University of Minnesota.

It appears he dealt with several of the areas I am dealing with now. Their school is located in a climate similar to, altho not quite as bad due to Lake Effect, as Michigan, when it comes to flight training.

He concludes, ""Over the years it became apparent that there was a growing demand for aviation-related programs in higher education due in part to the growing importance of aviation in the national economy." He also states, "In 1973 an agreement was reached that the General College would award "blanket" credit for aviation courses completed at any approved aviation training facility."

He also says, "Many Twin Cities students were going out of the state to find suitable aviation programs." This is the case in west Michigan as well.

He quotes Guidelines developed by the University Aviation Association (UAA) (Kitely, 1976). He claims, "courses preparing students for Federal Aviation Administraion (FAA) Commercial Pilot Certification are generally considered to be at the associate degree level (i.e. freshman-sophomore courses), whereas courses preparing student for FAA Flight Instructor and Airline Transport Certification are generally considered to be at the baccalaureate degree level." UAA lists associate courses and include flight instructor as "optional" on the associate degree level. Two schools I reviewed, LCC and NWC, both offer credits thru the instrument instructor rating for an associate's degree.

He states that most of their students applied credits towards a bachelor's, rather then associate's degree.

First suggested in 1980, by winter of 1981, "all preparations and negotiations were completed and seven one-level aviation courses were listed in the General College Bulletin.."

This is reassuring to me, since this is where the greatest gain in job opportunities over merely being a rated pilot seem to occur. This is the emphasis we will encourage with our students.

Steinhauser states "From winter 1981 through winter 1982, 261 interested students each had a personal orientation of about 30 minutes..." He documents actual enrollments from 9 students in Spring of 1981 to 20 by Spring of 1982, with a total of 20 which "have received approval for baccalaureate programs which have an aviation component."

Apparently the need for a bachelor's degree in aviation was recognized by a majority of the students enrolling in this program. A "personal orientation" was used as an introduction to the program for prospective students. Nearly 300 were interested in the first year. In 1990, the interest may be greater than this, since the shortage of qualified pilots has received a lot more national media attention now. This program got underway quite fast.

Use of Flight Simulators and/or Computer in Aviation Education

By far the most articles fall into this category and it probably is the least useful in determining details of my initial aviation curriculum.

The first article reviewed is Anderson and Trollip (1982) A Computer-Based Private Pilot (Airplane) Certification Exam: A First Step Toward Nation-Wide Computer-Administration of FAA Certification Exams. Interesting to note this pilot project was to determine suitability of this new method of testing and in spite of the positive results it claims, this is still not widely instituted by the FAA.

Anderson and Trollip cite several possible advantages of exams via computer: reduction of cumbersomeness, inconvenience, and costliness of the present setup. Their system taught users how to take the exam and apparently was "user friendly" because many of the testees had no previous computer experience. They describe junior college students' reactions:

> Some of the reasons people chose the conventional exam were made apparent when we went to a junior college to administer the PLATO version to an aviation class scheduled to

take the exam conventionally during its final class meeting. Class members learned of the opportunity to take the PLATO version when the system was described to them two weeks previously. Because only four of 20 accepted our offer, we asked class members to anonymously reveal the reasons they did not take the PLATO version. Six responses referenced a lack of previous use or knowledge of computer. Five described fear of an inflexibile system. Three were concerned about eye strain.

As of May 1, 1982, we have administered the PLATO version 55 times, 50 times to males. Two applicants failed the exam; one of these returned later and passed an alternate form. Eleven applicants said that they had no previous experience with computers.

With a 99% pass rate, it appears the computer exam did not hinder the test takers.The main advantage cited by students was immediate feedback.

Federico (1989) describes paper-based and computer-based testing of aircraft recognition of 83 males. He concludes in part: "Computer-based and paper-based measures were not significantly different in reliability. . . . Statistics associated with the canonical correlation suggested that the predictive validity of computer-based measures approximates that of paper-based measures."

Computer Aided Training Evaluation and Scheduling (CATES) was discussed by McDaniel (1982). He used 29 pilots undergoing training. He concludes: "Results indicate the CATES system requires less information to make a decision than the current human-judgment system and is reliably more accurate, suggesting greater consistency and accuracy. . ."

Measuring Spatial Ability with a Computer Managed Task was reported by McDaniel, E. in 1985. He tested 21 students and found "a moderately high relationship between performance on the Wheatley Cube and the Shepard-Metzler. Both tests perform equally well in predicting the ability of student pilots to quickly determine the orientation and direction of their aircraft in simulated flight." There were four different types of tests used.

The FAA allows some use of flight simulators in lieu of actual aircraft flight time. Up to a maximum of 20 hours can be applied to the instrument rating. Some schools use maximum simulator time; others use none at all. Reasons for using simulators are lower costs, ability to "fly" the simulator in bad weather and sometimes convenience and the possibility that a flight instructor may not have a current medical exam. Cost and weather are probably the biggest reasons.

Orlansky (1982) evaluated simulator use in military training and concluded they and computer-based instruction had an overall time saving of 30 percent. He stated, "Reduction in the time needed by students to complete their courses, when translated into reduced costs for student pay and allowances, fewer instructors and support, can represent real cost savings . . "

Others who reached similar conclusions are Thode and Walker (1983) who state, "Cost comparisons reveal that ISD costs are minor (1 percent) compared to total cost of aircrew training."

Richards (1982) was more concerned with quality and concentrated on visual interpretation of low level terrain. Students' perceptions of loss in altitude and change in forward speed and altitude were monitored by Owen (1987).

Polzella (1987) cites a survey of 534 simulator instructors on the use of aircrew training devices (ATDs). He concluded " The results indicated that the features that were rated highest were those used for training management, variation of task difficulty/fidelity, and monitoring student performance."

Pieper (1984) evaluated 21 student performances on an Interactive Graphics Simulator for procedural equipment operation and troubleshooting activities and concluded "IGS-trained students performed significantly better on the troubleshooting test, no other significant performance differences were found."

"Expressive dimensions of communication are an integral part of pilot performance," claims McCoy (1985). She was discussing instrument flight, in an attempt to understand how the instrument flight pilot incorporates the technology of flight and of instrumentation with every act of flight.

Sorenson (1983) states, "pilots can learn to fly without leaving the ground." Sorensen continues, "air safety has significantly improved since the FAA approved using simulators, replacing a large portion of training received in actual aircraft."

Thomson (1989) lists the following reasons for using simulators: "cost, safety, practice time, and the ability to train in adverse conditions at any time. The effectivenes of simulators is measured by level of fidelity, cost, feedback, transfer of training to the operational equipment, and increase in skill level."

Thomson continues, "Woodruff determined that innovative training methodologies used together with a flight simulator having limited visual and motion capabilities can produce a significant reduction in aircraft training hours required to complete Undergraduate Pilot Training. The purpose of training devices is twofold: first, to provide opportunities for the student to practice his/her job performance, and; secondly, to provide original learning opportunities for the students."

He concludes with:

> A training program that properly utilizes the strengths of part-task trainers and simulators can allow the student to easily transfer a majority of the skills learned to the operational equipment. The selection of the optimum media mix along with the level of fidelity, and the amount of feedback provided are ways to ensure that transfer of training can occur effectively. The training developer must be aware of these options and be knowledgeable to derive the most effective training media mix. Ultimately, the goal of simulators is to provide the trainee with the ability to effectively transfer skills learned to his performance on the operational equipment.

In conclusion, the concensus seems to be that use of simulators does not diminish quality of training received. It can reduce costs to students and trainers (i.e. the military), however it is difficult to translate this training into civilian terms when the ultimate costs of the simulators and aircraft for which they are substituting vary so much in cost. A military plane costs several million dollars and a full use simulator can cost three times the plane, however at $2,000 per hour flight costs, the total costs can be less. A table top simulator will not "simulate" motion and hence won't be as useful. Its main value appears to be in the chaining of procedures, which students can practice over and over prior to getting into an aircraft.

Summary

Literature reviewed covers several aspects of a college level curriculum.

It shows a variety of skills will be learned, utilizing different human capabilities from attitudes to intellectual skills to the more physical motor skills. Different types of teaching methods and materials will be needed to address these differences.

A variety of complimentary skills will also be needed in most fields. Tops among these are communication, both oral and written, and computer skills.

Any field today, especially aviation, will attract women and minorities. They can generally be expected to do as well as traditional white males, altho some blacks may need more assistance in the academic areas. Personality matching of instructor/student in the intravert-extrovert area probably will enhance training facility for males. Simulator use in flight training does not appear to diminish quality of the pilots.

A balanced curriculum will, based on the literature, include general education, writing skills, auxillary skills such as busines and/or mechanical abilities. It will also have the input of many sources, including potential future employers.

Degreed graduates in a technical field such as aviation can expect to earn more in a lifetime than non-degreed people with the same technical training.

It appears that the curriculum I have developed is validated by the literature reviewed.

Chapter III

THE NEW CURRICULUM

General Description

The New Curriculum is described in detail in Appendixes K, L, M and W. The courses to be initially offered are listed in Appendix K (4 pages) and W, with prerequisites and lab fees included with a brief general description of what is to be covered. The rotation for an Associate of Applied Science (AAS) degree is listed in Appendix L, with the Bachelor of Business Administration (BBA) (The only Bachelor's level degree approved for MCBT by the North Central Accreditation at this time. When a Bachelor of Science is approved, this program will possibly be changed to that degree designation.) listed in Appendix M. These rotations will be discussed in further detail later.

Accreditation/General Education Requirements

North Central requires 25% "general education" classes for a degree. For an AAS at MCBT, this means 24 credits. The curriculum has been set up this way, to include: Composition I and Composition II, psychology, introductory algerbra, political science, and speech. It was thought by some of the college's current staff that geography and technical writing might not meet the North Central criteria of "general ed" as they appear to be cruicial to major. Technical writing, geography, introduction to computers, and introduction to business are also included. Some flexibility is intended. For instance, MCBT offers two psychology courses on a freshman level: Human Relations and General Psychology. It was mentioned by staff that Human Relations would probably be more appropriate for this curriculum. However, if a student has already had general psychology, or transfers in a psychology course that equates to it, we would allow this substitution. General algebra was chosen as the minimum level thought needed to enable students to learn the ground schools and, if they later chose the BBA level, to take advanced courses. Our thinking is that the easier we make it for students to get into the program, the more likely we are to attract students who are intimidated by the heavier academic requirements of aviation programs with an "engineering emphasis" such as offered by WMU.

Often this extra technicality, although not harmful, is really irrelevant to good piloting skills. Computer use will be needed in several ways: in business aspects of flying, in sophisticated airline planes (jets), and possibly in the future, in the actual taking of FAA tests(Anderson, 1982). The political science course we require is actually a "study of the functions of government at the national, state, and local levels." Professional pilots will be dealing with this throughout their careers. A basic understanding of governmental processes and agencies is a good preview to the specific workings of the FAA, MAC, and other regulatory agencies they will encounter. While the associate level people will not get much business training, introduction to business should give them a basis.

The emphasis is on writing and speaking. With two general composition courses, students should be able to write well. The technical writing will aid them in all the reports they will be doing and any special accident reports etc.(May, Areval, 1983; Olds, 1987) that may occur. General speech is also included. This will be topped by "Aviation Communication", a class which I plan to develop and teach. In this course, students will write and prepare presentations on both a technical level, for an audience that is technically knowledge about aviation, and a "general lay audience" level.

This latter is what they might do to promote aviation or its favorable aspects with the general public. As more and more pressure is put on communities to find suitable industrial sites, more of them are considering converting small airports to other land uses. (South Kent Airport recently closed as an airport for this reason.) This battle is a constant and universal one and one where good communication skills can help knowledgeable people get out the message as to how important a small airport can be. Audiences for this message can be elementary students, or even senior citizens. The "aviation communication" class will include opportunities for students to research, write about, and present, various aviation related topics to any type of audience they choose, including children, or businesspeople-type organizations.

FAA Testing Orientation

The "end point" of many course is passing the FAA written or flight test. In some cases, where training in a certain phase, such as instrument, is lengthy, there are more than one course. Then the final exam of the course is the FAA test. In other some other schools' curriculums, the FAA test is not administered and students are left "on their own" (see Appendix F). This curriculum introduces them to the FAA testing system from the first course and it is hoped that they can begin a good, long relationship with this agency. Many of our students will become flight instructors for a portion of their careers (see Appendix E), even if they plan to become airline pilots eventually. They will then be preparing students for these tests. The FAA written test consists of multiple choice questions. Test takers receive a list of questions that they must then pick out of a book which contains many questions. Typically, their list will be 50 or 60 (or, in case of instructors, 100) questions out of a book of 600+ questions.See Appendix V) They will also have to refer to charts, graphs, and sectional charts(maps), in determining their answers. The most successful procedures for doing this are a legitimate part of a successful ground school course. The flight check is a practical application of what they have learned. While a score of 70 or better on the written is passing, the flight check has many tasks and it is possible for a student to have to return to "re-take" only a portion of the test. Grades in ground school will be based on: 70-79, C; 80-89, B; and 90-100, A. The flight training consultant, who is also the FAA designated flight test examiner, will work out a "grading scale" for flight classes. It is our intent to include some aspects of the organic curriculum in this.(Oliva, 1988; Glatthorn, 1987) This is a very difficult decision, as we would like to think all passing pilots are "A's" if they are to be safe. The discrimination points from an "A" to a "C" may be very small.

The problems with this curriculum are probably going to occur in the "incompletes" necessary and in scheduling. Flight training in the real world is a continuous process and breaking it down into "term courses" is not easy. There will be overlap. For this reason, we have kept absolute prerequisites to a minimum. The school's computer at term registration won't have the data on training completed, only on actual credits earned. There will be concurrent enrollments in many cases, because more than one sequence may be completed within a term. However, often many tasks will have been learned previously. To simplify registration procedures, and reduce the number of "permit to register" slips that will have to be issued to students who haven't yet received credits, the prerequisites are minimal.

Program Philosophies (organic curriculum)

Appendix O (2 pages), Aviation Program Philosophies, describes the organic curriculum. (Oliva, 1988; Glatthorn, 1987; Garne', 1985) The emphasis on "people skills" and the "service business" orientation are defended, along with the importance of writing and speaking.

Two things which aren't detailed in the current offering, will be added within two years. These include a "crop dusting" sequence and a cooperative education arrangement with Federal Aviation Administration Air Traffic Control. The crop dusting has been outlined and an advisor recruited. However, it was thought by MCBT officials that, in order to get this program "off the ground" within a short period of time, it would be best to leave the crop dusting out of the initial course offerings. Flight courses will have to be developed and suitable aircraft obtained. The ground courses will prepare future crop dusters to become certified commercial pesticide applicators. This testing is done by the U.S. Dept. of Agriculture and passing the test will again be the "pass the course" point.

Leonard Parmley, FAA Tower Chief at Muskegon County Airport has supplied a copy of the cooperative agreement the FAA uses with colleges. This program enables a student to work a term or semester for the FAA, two times during his/her pursuit of a bchelor's degree. Upon degree completion, the person then goes to the FAA Controller School in Oklahoma for further training and becomes a "trainee controller." These are good paying professional level jobs. It is not required to become a pilot to be a controller, and possibly some other business majors at MCBT would like to enroll in this program

We also planned an "aviation minor" for other business majors.(See Apendix N) A "minor" at MCBT consists of 24 credits and business majors must each have two minors. Our aviation minor would include the private pilot license with instrument rating. This would not qualify the person to carry passengers for hire, however he could fly on business if the flying was "incidental to business". In other words, sales people could cover their routes by air much faster and probably more inexpensively than by auto. College officials at MCBT indicated they would be receptive to allowing this "minor" to be included in their overall BBA programs.

Two Degree Levels

Associate's Degree

The Associate's Degree granted will be the AAS. The complete rotation for this is Appendix L. All the general education requirements, as well as other general courses deemed necessary, are included in this. It will bring the pilot up to the level of Certificated Instructor Instrument. This means s/he will have a commercial pilot's license, with instructor ratings to teach beginning, advanced, and instrument students. This is deemed of greater practical application than earning the multi-engine rating would be. However, there can be some flexibility in the final quarter. Students with a personally perceived need for taildragger, seaplane, aerobatic or multi-engine flight will be allowed to substitute these. When the crop duster tract is fully developed, those choosing it will not become instrument instructors. This should make the New Curriculum's graduate competitive with schools in Michigan currently offering associate's degrees for pilots.

Bachelor's Degree

The degree granted currently by MCBT is the Bachelor of Business Administration (BBA). This rotation is described in Appendix M. The specific general education classes were copied from the "Industrial Management" degree. The business, finance, personnel management, accounting sequence, etc. have already been worked out for that major. The general education core is also included, altho we may want to make a couple of science substitutions for aviation. It calls for three math courses and two physics courses. I would like to include a general chemistry and geography, and have students select five of the seven options. Chemistry will be needed by future crop dusting majors. (See Appendix W for changes). We will substitute the aviation specialty minor (see second page of Appendix M) for one of the minors required in industrial management. This should provide a versatile business management level program that will enable the graduates to fill a variety of jobs, including aviation management or general business, if actual flying becomes inadvisable due to medical or personal considerations.

Preliminary interviews and research seem to indicate that the BBA is the better option. (Hixson, 1982) Because of the MCBT overall policy explained in Appendix P (The 2 + 2 option), students will be able to complete the AAS and then later return to complete the BBA. Or they may elect to stop at the end of the AAS. Employability is undoubtedly enhanced by the bachelor's degree. However, it is not always possible, for personal or financial considerations, for students to continue in one single stretch, the complete education they really need. This dual approach should give them the greatest flexibility, options, and future choices. The ultimate employability of the curriculum will be discussed in a future section. While there does not appear to be any literature on this approach (using the second two years of a bachelor's for the general courses and covering the major first), it is already in operation at MCBT and this new curriculum has been designed to fit that mold. It seems reasonable that people who want to fly for a living would be more interested in continuing their education if they had the opportunity to fly in the beginning. And again, in real life people are often forced to terminate or interrupt their educations short of a desired goal. The 2 + 2 approach will at least give them a chance to be employed in their chosen field (flying); if they are "held back" to lower level jobs by a lack of a complete bachelor's degree, at least they will be working and flying!

Student Sources

New Students

There will probably be two types of students the program will attract. The first is the "new student", one with no previous flight training and probably no college, altho some may have been enrolled in other majors and have some general college credits.

Flying for a living is a demanding career. The hours are long and irregular; the pay, at least initially, is often very low until time is built up; one must "go where the jobs are." It is not a career that is compatible with being a single parent or having a lot of responsibilities that are time demanding outside of one's job. The physical requirements are also stringent. While heavy lifting is not required, one must be in good health, on no medications, and have excellent vision. It is also not compatible with a life style that includes drinking alcoholic beverages frequently. These factors will be pointed out in any public information meetings held or literature printed.

Most of the "new students" will be fresh high school graduates, seeking a career that they would like. To determine how many might be out there, I did a sample preliminary survey. Appendix R is a copy of the letter sent to high school counselors; Appendix Q is the survey form the students filled out. As of Jan. 29, 1990, 73 had been returned. There were also approximately 100 done by classes in aviation at Grand Haven Junior High School. The 73 represented 14 different schools. Two had no students interested enough to fill out the questionnaires; Fruitport had 20 that I met with personally. They were given "release time" from their regular classes. I also had a display at Spring Lake High School during lunch hour and talked with seven students there. Some obviously will not be college material as the form was overwhelming to them. But most of them appeared bright and capable and when they were informed that drinking and drugs would keep them out of flying the most common remark was, "No problem there!" I also pointed out to them the importance of good vision and health and again received the "No problem" answer. While some students do wear corrective lenses and might not meet military vision requirements, most of them seemed to think they would meet the FAA vision requirements.

There are 15 or so from the Holland/Zeeland area attending other schools this year. Several of my former ground school students are at WMU. It is believed that some of these might transfer to MCBT. I talked with one North Muskegon high school senior who is enrolled in WMU for fall who is very eager to have our program instead. One of his complaints is that with the WMU curriculum, he is reponsible for getting the private pilot rating on his own. This is a young man who is currently taking physics, and three other high school classes, plus cooperative education where he works 20 hours a week and states this is his easiest semester of his high school career! This is just one example of why our curriculum which begins with private pilot ground school and beginning flight appears to be more suitable for these young people.

One other advantage is that we will be able to insure good quality flight instruction and safety attitudes right from the beginning. While most of the students at WMU who get their private licenses on their own, do get good flight instruction, there is no guarantee of this. Our flight curriculum provides this.

There may be some out of school people who will be interested in our program as well. The main difference between this program and many programs which attract such people is the age of our students will probably by under 25 or 30 and most of them will not be parents with a lot of responsibilities.

As far as the general education requirements, we will allow some flexibility. As stated previously, if transfering students have the "wrong" psychology class, we won't make them take the preferred one.

Already Licensed Pilots

The second category of students is those who are already licensed pilots and who merely need a college degree.(Hixson, 1982). Gary Vander Veen, who will provide the flight training portion of the curriculum, has at least 10 lined up who are just waiting for the program to be announced. One has already enrolled at MCBT to take some of the general courses. These are people who reside in the local area and want a college degree in aviation. Some of them have many flight ratings and hours of logged time; others are at the private pilot level. For various reasons they do not choose to "go away" to school and are very eager for a local program.

The University Aviation Association (Kitely, 1976) recognizes this when they advise, "Institutions which recognize FAA certificates/ratings as indices of requisite knowledge and/or skill should establish validation procedures to ensure that the student's training and experience equates with the content of the institutions's flight related courses. The validation procedures could include one or a combination of oral, written, and/or practical examinations."

In my course descriptions, (Appendix K) this is covered in AVT 100, Lapsed Pilot Refresher Seminar, and AVT 101, Flight Review. The "Lapsed Pilot" seminar is ground school for people who have licenses and haven't used them in recent years. Since there have been a lot of changes in the FAA regulations regarding airspace, there is much to learn that is new, as well as review. There may not be many in this situation, however this class will also provide a service to the flying public and enhance the school's image and contacts in aviation. The Flight Review is designed to be totally flexible. The Flight Training Consultant will determine what is needed on a case by case basis. If many hours of flight instruction would be required to bring a pilot up to our standards, more than one credit may be needed. Basically the pilot will be administered a brief written evaluation and a "flight check" with a flight instructor. This will cover his/her current level. In other words, if we are evaluating a private pilot s/he will perform those tasks; instrument pilots will be asked to do instrument maneuvers and landings. A licensed CFI or CFII may be asked to do a "lesson" for the examiner. At the point the pilot is deemed competent by our standards, s/he will be issued equivalent credits in our curriculum for whatever ratings s/he holds. For instance, a private license is "worth" 12 credits: AVT 102, AVT 103 and AVT 104. (See Appendix K) It is possible for a flight instructor to have 48 credits. These are credits s/he gets toward either the AAS or BBA degree. S/he doesn't have to pay tuition or lab fees for these classes. While no aviation classes are officially eligible for CLEP, this is basically the principal involved. Other schools don't do this! I have talked with flight instructors and pilots who express frustration at this. One CFII with over 2000 hours of flight time would receive nothing credit-wise from WMU. It appears there may be a large number of pilots who would want this. So far, without the college officially adopting the program, no real survey has been made. Many of these pilots also have some general college credits as well as flight ratings. The MCBT policy stated in their catalog is, "A transfer student must complete 48 hours of credit at Muskegon College to earn an associate or bachelor degree. . . . The College will accept credit from baccalaureate institutions, special purpose institutions, community/junior colleges, technical or vocational institutions, proprietary institutions, and United states Armed Services. To transfer classes must equate to and be compatible with similar Muskegon College Classes.... Credit from business and industry training will be evaluated, possibly with waiver testing." (MCBT catalog, page 11). There may be students who will only need the 48 credits. If this is the case, we may be able to graduate BAA people in one or two years and have these "graduates" working much sooner than would be expected with a new program. This will be discussed further in the next section.

Every effort has been made to design a curriculum that is as flexible and appealing as possible to the widest variety of potential future professional pilots. Options to earn just the pilot with instrument rating and to get a "head start" on an air traffic control career are also offered for those who don't want to become full time professional pilots. Math requirements have been kept to the minimum, as are physics, chemistry, etc. in hopes of attracting good pilots who don't necessarily excel in the academic sphere. (See Brown, 1980) The rational of the business emphasis will be discussed further in the next section.

Employment Orientation

Philosophy

Appendix J, which is page 5 of the MCBT catalog, states in part, "To prepare the student for business and technical competence . . .To give the student practical experience and knowledge in a chosen field of study . . .To assist graduates in developing career opportunities and securing employment."

All of these goals are included in the curriculum.(Norwood, 1988; Miller, Clark, 1983) Hopefully our graduates will have technical competence in their chosen field of aviation. But without "advance groundwork" on the part of the educational institution, they may never get the opportunity to display this competence. I can speak from personal experience with Grand Valley State Colleges' total lack of doing the ground work for future employment on my undergraduate major of environmental sciences. Altho my course work was comparable to similar programs at U of M and MSU, based on comparing notes with students there, I was denied taking several state civil service exams because the words on my degree, environmental sciences, rather than wildlife biology, etc. were not acceptable. I have vowed this will not happen to people in the new aviation program. We will begin before the program even starts, to establish the reputation that our students will be exposed to a good education in their field (as I was). The methods we will use include employer surveys and input, public information meetings, and an extensive public relations campaign. Of course, another benefit of this will be to recruit students.

Toward this end, a questionnaire (Appendix U) has been worked out. My suggestions to the college will be that before they notify the news media, these questionnaires be sent to corporations and others who employ professional pilots. Appendix S lists these corporations. Their opinions will be used in refining the curriculum and future mailings will be made to inform them of this.(Jay,Gose, 1982).That way, when we do have graduates, these companies, at least, should be interested in interviewing them, especially since they will have had input into the offerings of the curriculum.

Small airports (Appendixes S and T) will also be queried. The plan is to hold some public information meetings on flight training at these facilities. They will undoubtedly recruit students for their own flight schools from people who attend these meetings and don't need a program which offers a college degree. In exchange, they may refer local people on to the college and hopefully most of these airports will offer internship opportunities for our students. (See Appendix K, course # AVT 110.) There will be several advantages of this: the students will meet and make contacts with a variety of airport users, people involved in aviation who may serve as references later on; they will gain "hands on" experience in the day to day operations of a small airport; and will build ground work for eventual flight students of their own when they become flight instructors. The contacts, references and possible job opportunities are things one can not "buy".

Other internship opportunities will include "ride along" time with commercial operations for advanced students. Gary Vander Veen, the proposed Flight Training Consultant for the program, will be setting this up. He uses such an approach now with Tulip City Air Service where he is in charge of charter flights. A co-pilot on some flights may be a commercially licensed pilot with relatively low flight time. This way the student gets to build hours and often in a type of aircraft that would be very expensive to rent. (See Appendix E, Aviation Career Ladder) Insurance companies mandate 1200 hours of flight time to carry passengers on commercial charter flights. This is not an FAA requirement, but it necessitates most pilots "building hours" to reach this point. (One may fly day flights with cargo only at 600 hours, however these flights are so few in comparison that few charter services will hire pilots for this) Most pilots build hours by becoming flight instructors, where they fly "free" (the students rents the aircraft) and actually get paid for their time. Our curriculum will afford some of our students the opportunity to instruct some of our other students thru flight instructor interships (AVT 112, 113, and 114 in Appendix K). In addition, our public information meetings held at small airports may enable them to build students of their own and part time "employment" at these same airports. BBA students will earn their CFI ratings while they still have one or more years of general courses to take, and by the time they graduate, will have had a chance to build quite a few flight hours.

We also plan to ask companies with an interest in promoting aviation if they would contribute to a "job bank" for our students. These would be summer or "off term" full time jobs and part time jobs where the students could earn money towards their flight fees. Such employers would be getting bright, physically fit, drug free, employees and at the same time offering them a chance to pursue their careers. Some of these factory type jobs would pay better on an hourly basis, then most part time jobs open to college students.

The business orientation of the BBA degree should also contribute to the overall employability of the graduates. If they can't fly later in life, they should have a good basic business education. They will also be able to "manage" the aircraft operation of a company with one or two corporate planes. They will learn all the required paperwork for maintenance, scheduling, etc. Some of them may end up working in personnel or some other business phase where they will supervise the corporate aircraft and pilots. At least they will have the opportunity to learn all they will need to fill this employment niche.

All in all, our curriculum, coupled with the already excellent reputation for turning out employable people that MCBT has, should make our graduates competitive. Another reason this is important is that our program will be competing with schools like

NWC and WMU, who have been operating flight schools for many years. However, MCBT is no newcomer, nor is Tulip City Air Service. They have been in business 101 and 23 years respectively. Combined with the solid educational background built into this curriculum, it should be competitive.

Advisory Board

There is much more work to be done when the program is actually adopted. As stated above, questionnaires will be sent and information gleaned will be used to further refine the curriculum.(Oliva, 1988; Glatthorn, 1987) I would like to make some minor changes to the BBA program from industrial management and get more information on specific course content of some of the general education classes. MCBT has a policy to change current classes and possibly some additions could be made that would help our aviation majors. An example of this might be in the technical writing class (WRI 104), to add writing NTSB reports to other types of writing.

Apendix T is a questionnaire for potential advisors. Several have been identified. The college has advisory boards for all its programs. These people are professionals in the field and again, may help graduates get job interviews. Examples are an FAA designated medical examiner (Paul Haight, D.O.); the Control Tower Chief and Airport Manager at Muskegon County Airport which the Flight Training Center will be located; Mary Cresson, recently retired administrator with the MAC; Lois Stevenson, retired from the Muskegon Weather Bureau; Paul Derr, the FAA designated written test examiner for west Michigan; charter and corporate pilots; small airport managers; airline employment supervisors; high school counselors and aviation instructors; and the people the college will hire or contract with to work in the program.

Scope & Sequence

One of the difficulties in developing this curriculum is that it doesn't lend itself to the typical school scope & sequence.

Flight training is prescribed by the FAA in its regulations. Certain tasks must be covered before more advanced ones are. Much of this was changed or expanded on in the new regulations taking effect on Sept. 1, 1989. This prescribes specifically what must be done before a student pilot may legally be allowed to solo in the airplane. The flight instructor is obligated to make certain this has been accomplished. Each "flight task" must be logged in the student pilot's official Pilot Log Book. This record is also kept of all future flight training and solo flight, which is to be used towards future ratings. The greatest difficulty is in coordinating this with a typical school system, which has terms or semesters and usually three or four credit "classes". Flight instruction does not fit into this mold. In trying to coordinate the two "worlds" of the FAA and a typical college, I interviewed several flight instructors and their supervisors to determine the amount of time it takes the "average" student to master a rating or level. (Such as multi-engine, taildragger, etc) In many cases, the FAA mandates a minimum number of hours of dual instruction and solo flight. For instance, for a private pilot license this is 20 hours each. There are also breakdowns, i.e. three hours dual night instruction, three hours dual cross country instruction, 10 hours solo cross country flight, etc. I tried to match these required hours and estimated average hours with the school's 10 week term system. A typical class is four credits and meets four times a week for 10 weeks. Estimating two to three hours outside work, either reading, writing, studying, etc. for each hour in the classroom, I tried to balance the number of hours of credits for each flight class to make them as comparable as possible.

In reality, flight lessons will be on a "case by case" basis, with the flight instructor giving much guidance as to the individial sequence. Courses taken may vary greatly from one student to another. The same applies to individual tasks within a course. Normally students learn to stall an airplane prior to learning landing, since landing is in reality merely stalling the plane a few feet above the ground. Students usually learn to land in calm winds, which are aligned with the runway. Then they learn various crosswind landings, moving from mild cross winds to the more difficult. But these lessons are dependent on the winds. They may move ahead to another flight maneuver to await appropriate cross winds or the flight instructor may choose to take the student to an alternate airport, where the runway alignment is different, to get the cross winds needed. However, one instructor explained that a student who was very uptight about landing and always made him take over just prior to touch down because he lacked the confidence, did his very first landing is a strong crosswind. When the landing approach got out of hand and the student asked the instructor to take over, the response was, "It's so messed up now, even I can't land it." So the student, not attempting a "perfect" landing, but rather to get the plane on the ground, made his first landing. So much of the actual sequencing of tasks learned will depend on individual student progress, weather and other external conditions, and flight instructor judgement.

Other schools, for the most part, lump all the "tasks" for instrument and commercial ratings into one course and offer it over several semesters. This is usually Commercial Flight I, II, III, IV, etc, taken in succeeding semesters until completion.(WMU, LCC, NWC) With our curriculum, a student may choose to do this as well, by taking pieces of the instrument sequence and commercial sequence concurrently. The difference is with this new curriculum, they can be "broken apart" and the whole instrument can be completed first, or if a student already has his instrument, he can begin on the commercial. The courses for this are: instrument, AVT 106, 107, 108; commercial, AVT 202, 208, 209. The middle course for each is a simulator course, the others are flight.(Courses are detailed in Appendixes K and W) Again, individual tasks will be sequenced by the flight instructor on a case by case basis. A student may be enrolled, especially summer term, in all the above mentioned courses at the same time. He may have an hour of dual instruction in the morning, with some tasks practiced from the instrument sequence and some from the commercial, then fly for a three or four hour cross country, which is building logged flight time needed for one or both ratings, and then possibly have an hour of dual instruction again in the late afternoon or night flight. At the end of the term, all logged tasks will be added up and credit given for the courses in which the student has met all those tasks listed in the syllabus, or passed the flight check ride, when that is the end point of the course.

Ground School will be sequenced: private, instrument, commercial, fundamentals of instructing, CFI, CFII. The ground schools, with the written test as the end point, will be coordinated with the flight. A student must have passed a written test before he can take the flight check ride. Hence, instrument ground school must be passed prior to completion of instrument flight, AVT 108. Since most ground schools beyond private will be offered only once a year, the students and academic advisors will have to consider where the student is in relation to his flight training to be certain to fit the ground school in before the flight training completion. The same will apply to transfer in students with some logged flight time. The actual progress thru the flight training will be determined individually by the flight training consultant, however a guessed-at progression can be predicted by the student and academic advisor to be certain that the ground school is scheduled before the flight check ride.

Summary

In summary, the new curriculum offers several choices no other current schoool does. It offers: associate's or bachelors; college credit for earned flight ratings; begins with private license; can transfer in credits for other aviation college programs; can have a aviation minor with business major; the aviation bachelor's has business emphasis rather than engineering; basic flight instructor rating can be earned in two years, or extended over four years if a bachelor's is chosen as the option;a solid general education core is included at both levels; on the instructor courses, the fundamentals of instructing is separate and both ground instructor and flight instructor ratings can be earned.

While many of these options are available at one or two schools, there is no other single school that offers this great a choice in flexibility. The two degree levels, the ability to obtain college credit for flight ratings, and the ability to start with the private license, appear to be the main options potential students request or express concern about.

This curriculum will begin in the fall of 1990 at Muskegon College of Business and Technology. It will, of course, be several years before a detailed analysis can be done to see which of these options are utilized and how the curriculum functions with real students.

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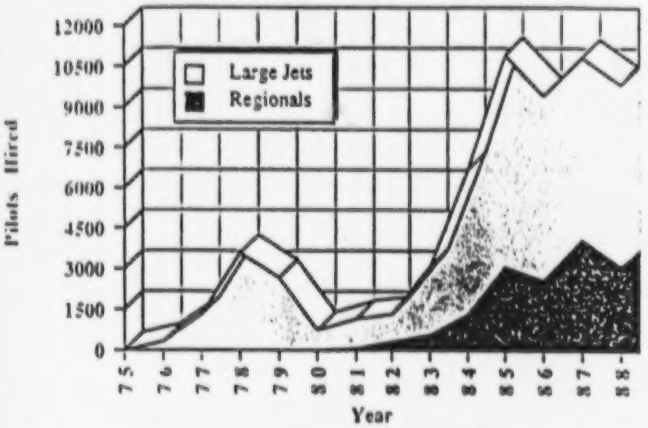
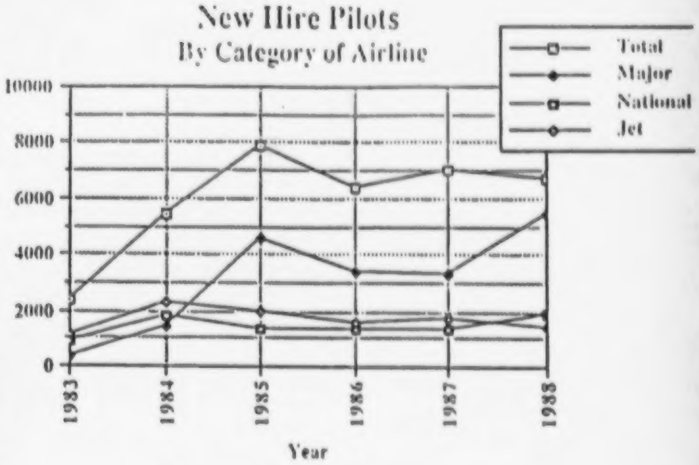
APPENDIXES

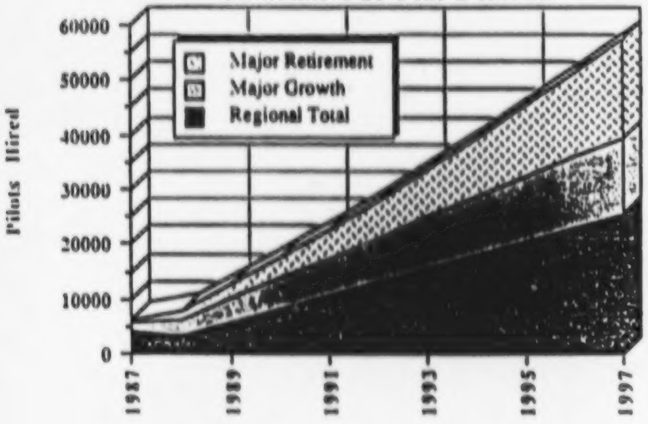
APPENDIX A



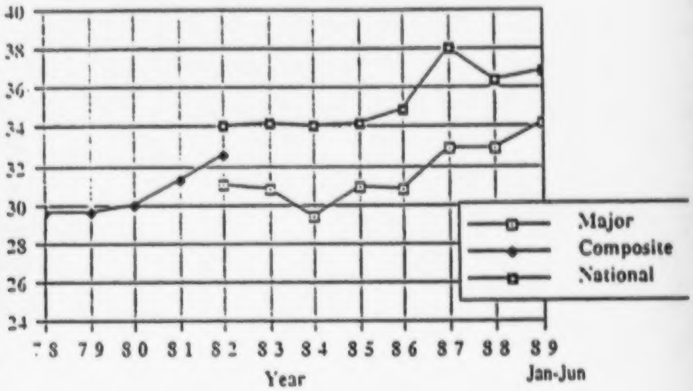
New Airline Pilot Jobs
By Year 1975 - 1988



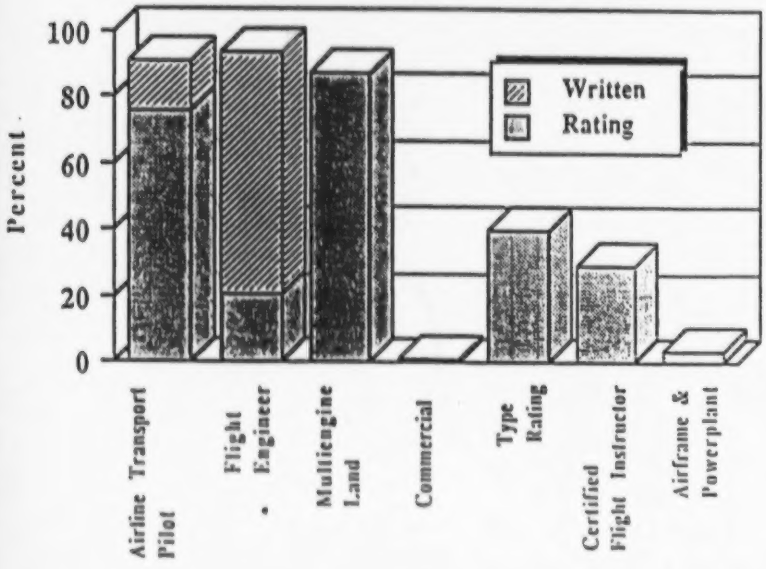
New Hire Pilots
By Category of Airline



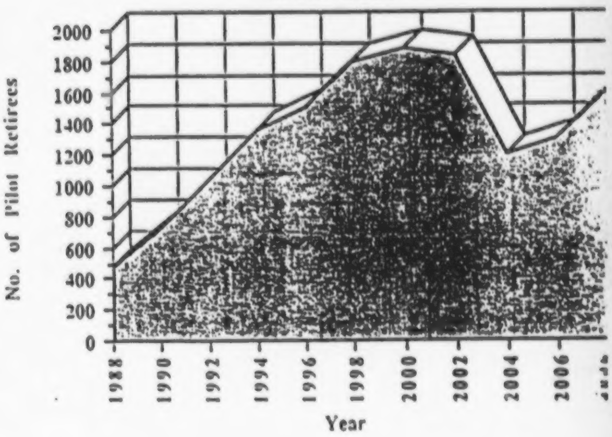
Future Airline Pilots
Cumulative 10 Year Demand



Average New Hire Age
Major National Airlines



Flight Ratings & Certificates
1988 Major Airline New Hire Pilots



Pilot Retirements (Age 60)
1988 - 2008

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Pilot Salary Summary 1989-1990

The *1989-1990 Pilot Salary Survey* assists you with your career decision by including the latest salary information for airlines, helicopter operators, corporate operations and the military. This year's survey is expanded to include a career earnings model on page 35 so that you can compute your lifetime earnings with an airline. A 30-year-old pilot will earn approximately $5 million throughout his lifetime. Also new this year is expanded information on retirement benefits at major and national airlines on page 24.

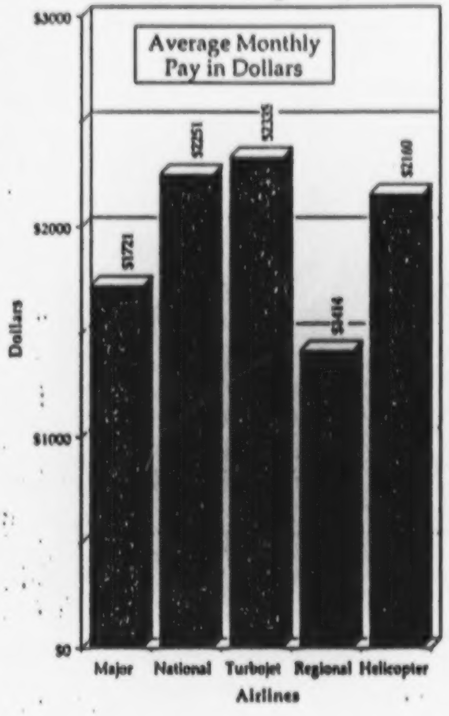
The average annual maximum salary for a major airline pilot is $138,929, while the average annual maximum salary at a national airline is $80,959.

We find that a first-year pilot can make the most money at a turbojet carrier (airline with annual revenue less than $100 million). Turbojet carriers' average monthly pay in the first year is $2,335 while major airlines' monthly salary in the first year is only $1,721.

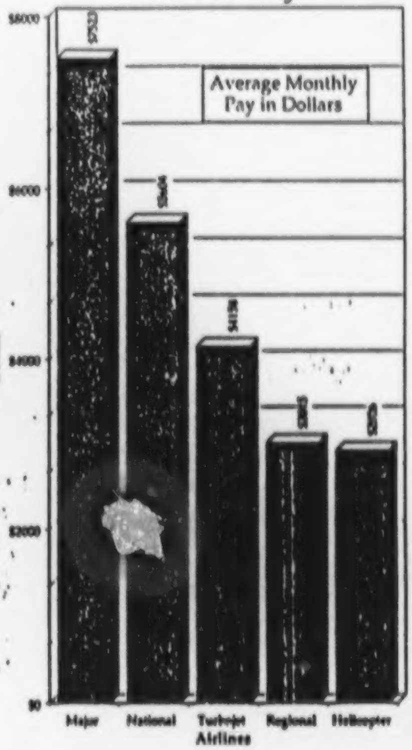
It is in the second year that major airlines pass all other categories of carriers in pilot salaries. The average second-year pay at major airlines is $3,001 monthly, while at national airlines the pay is $2,840. Regional airlines employ the lowest paid second-year pilots at $1,414 monthly.

The top paying airline is Delta with a salary of $169,879 as captain of an L-1011.

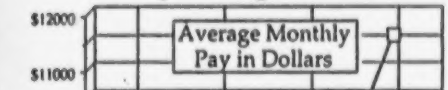
Starting Pay



10 Year Pay



Pay Progression



In summary, a major airline is determined to be the best career choice in terms of lifetime earnings (see *Pay Progression* chart).

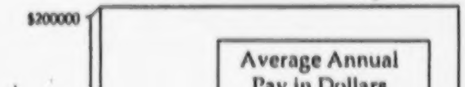
Please note that pay scales throughout this survey have been converted to equal pay periods for easy comparison. Other differences in pay may exist due to changes since the survey was printed. Please advise FAPA of any discrepancies so we may update our records.

Information in this survey is updated monthly in the Career Pilot Job Report. Members should permanently record new salary information in this book.

PILOT WORK LOAD

Fly 80 hours a month–block to block
Fly 10-20 days a month–average 15 days
Trips to airport 2-15–average 4-5
Hours on duty: 160 (2:1 ratio, Duty to Flight Time).
Hours away from home: 240-320 (3:1 or 4:1 ratio, Trip to Flight Time).
Number of nights away from home each month: 0-18, average 10.

Maximum Pay



FAPA Aviation Career Report

Prepared by Future Aviation Professionals of America – 1-800-JET-JOBS

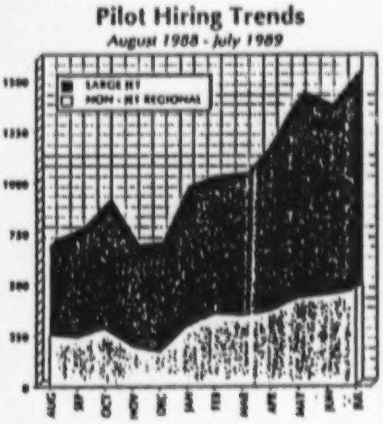
Airline Pilot Summary

—Hiring trends

Major, national and large jet airlines hired 1,056 cockpit crew members in July, up 15 percent from June's hiring of 900, and hired 8,397 in the past 12 months. Non-jet regional carriers hired 469 in the same month and 3,796 since July 1988. Selected helicopter operators hired 63 pilots in July and 694 in the last 12 months.

Hiring for July was up 155 percent from July 1988 when major, national and jet airlines hired 470 crew members. Regional hiring also was up, compared to the 328 hired in July 1988.

Eastern continues to lead hiring, trying to replace pilots who are on a sympathy strike with its machinists' union. The carrier hired 394 in July and plans to hire 376 in August and September. United also continues to add large numbers of pilots to its payroll, hiring about 100 each month.



Pilot Hiring Trends

August 1988 - July 1989

New Hire Pilot Qualifications Summary

The following is a chart showing the qualifications for pilots hired in the first six months of 1989 by major, national, jet and regional carriers. According to FAPA, many requirements such as vision, age and education have softened because of the shortage of pilots who could meet the stricter rules. Other requirements such as flight experience, licenses and certificates have not softened as dramatically as others.

	Major	National	Jet	Regional
Survey criteria:				
Total pilots hired	3171	916	608	2233
% pilots surveyed	29.2	19.1	16.4	19.9
# pilots surveyed	927	175	100	445
% FAPA member	52.1	N/A	53.0	38.9
Flight ratings and certificates (%):				
Total with ATP	80.8	88.0	81.0	51.7
Total with FE or FEw	88.7	59.4	46.0	42.9
ATP and FE	17.6	18.9	17.0	3.1
ATP and FEw	53.7	33.7	19.0	24.2
ATP only	9.5	35.4	45.0	24.5
FE only	2.8	4.6	5.0	2.2
Comm. and Inst. only	1.8	4.6	7.0	24.5
Multi	84.9	83.4	93.0	92.8
CFI/CFII	33.9	53.1	58.0	74.4
Type rating	29.7	43.4	17.0	10.6
Flight experience:				
Flight time range	650-17500	1300-16400	650-23000	400-11000
Total hours (avg.)	3910.9	6657.8	4165.2	2644
Jet hours (avg.)	2003.1	1908.7	1212.5	169.4
Turboprop hours (avg.)	1068.2	2077.2	1036.0	474.2
% jet time	77.4	67.9	55.9	26.5
% turboprop time	68.2	82.9	80.0	70.9
% neither jet nor turboprop	1.7	0.6	7.5	25.1
% pilots with less than 2000 hours	14.5	1.7	21.0	36.2
Aviation background (%):				
General aviation	45.3	59.4	75.0	80.9
Corporate	17.8	37.1	40.0	32.6
Regional/commuter	28.8	48.0	54.0	32.8
Flight instructor	59.5	49.1	60.0	70.6
Previous civilian	35.5	58.3	63.0	82.4
Previous military	39.9	15.4	15.0	4.3
Education (%):				
Master's degree	20.7	9.1	9.0	3.8
Four years college	71.7	45.1	63.0	61.1
Two/three years college	5.7	34.9	17.0	16.2
Less than two years of college	1.9	10.9	11.0	16.9
Physical data:				
Age range	22:2-53:2	23:6-56:3	21:7-56 2	20:7-57:1
Age (avg.)	34:2	36:9	34:4	30:3
% over 40 years of age	22.0	42.3	28.0	9.0
Height range	62"-78"	62"-78"	64"-76"	61"-80"
Weight range	105-230	108-269	115-220	100-247
% less than 20/20 vision	21.9	30.9	29.0	24.3
Lowest visual acuity	20/100	20/200	20/200	20/400

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Maintenance Technicians Summary

—Hiring trends

At least 1,013 airline maintenance technicians (A&P or FCC technicians) were hired in June, and 9,258 have been hired since June 1988. Additionally, helicopter operators hired 65 maintenance technicians in June.

Eastern, trying to replace its striking mechanics, hired 225 in June. United continues its massive hiring with 180 new hires in June. Other top employers in June were Pan Am and Northwest.

This information is compiled by FAPA,
4959 Massachusetts Boulevard,
Atlanta, Georgia 30337

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COLLEGE/UNIVERSITY AVIATION PROGRAMS

Aviation is a growing profession that demands highly qualified individuals to fill numerous projected vacancies in the 1990's. Pilots, mechanics and avionics technicians will be in high demand.

The following list contains colleges and universities in Michigan that offer aviation related courses. Should you have any questions please contact the specific college or university

COMMUNITY COLLEGES/COLLEGES/UNIVERSITIES OFFERING AVIATION RELATED PROGRAMS

Aviation Abbreviations

PVT. — PRIVATE LICENSE
COMM. — COMMERCIAL LICENSE
CFI — FLIGHT INSTRUCTOR
INST. — INSTRUMENT RATING
A — ASSOCIATES DEGREE
B — BACHELORS DEGREE
C — CERTIFICATE
A&P — AIRFRAME & POWERPLANT
FBO — FIXED BASE OPERATOR
FAA — FEDERAL AVIATION ADMINISTRATION
A/C — AIRCRAFT

ANDREWS UNIVERSITY
Berrien Springs, MI 49104
616/471-1455
Aviation Department
Harry Lloyd, Flight Director
Certificate - Basic & Adv. Flt. Training
Comm. Pilot
CFI-Airplane
CFI-Instrument
Instrument Rating
Pvt. Pilot
Concentration in Aviation Tech.
Aviation Technology - A
Flight/Maintenance/Avionics - B

DETROIT INSTITUTE OF AERONAUTICS
BOX 809
WILLOW RUN AIRPORT
YPSILANTI, MI 48197
313/483-3758
LES R. KOEPKE
AVIATION MAINTENANCE (A&P)

EASTERN MICHIGAN UNIVERSITY
Ypsilanti, MI 48197
313/487-1161
Mr. Tim Doyle
Department of Industrial Tech.
Aviation Management Technology - B

HENRY FORD COMMUNITY COLLEGE
5101 Evergreen Road
Dearborn, MI 48128
313/845-9637
Joseph T. Hicks
Aviation Program Director
Aviation Ground School (class)

JACKSON COMMUNITY COLLEGE FLIGHT SCHOOL
2111 Emmons Road
Jackson, MI 49202
517/787-7012
Tim Keller, Instructor
Basic & Advanced Flight School
Pvt. Pilot
Comm. Pilot
Instrument Rating
CFI-Airplane
CFI-Instrument
Prof. Pilot - A

KIRTLAND COMMUNITY COLLEGE
Route 4 — Box 59-A
Roscommon, MI 48653
George Maroni, Instructor
Aviation Tech.-Cert. Diploma
Aviation Maintenance-A&P License
Ground School

LANSING COMMUNITY COLLEGE
Aviation Center
Capital City Airport
Lansing, MI 48906
517/483-1406
Gayland Tennis, Program Director
Ground School-Basic & Advanced
Pvt Pilot
Comm. Pilot
Instrument Rating
CFI-Airplane
CFI-Instrument
Multi-Engine Rating
Aviation Maintenance - A
Avionics Technology - A
Flight Technology - A

*** MACOMB COMMUNITY COLLEGE**
14500 E. 12 Mile Road
Warren, MI 48093

MONROE COMMUNITY COLLEGE
1555 S. Raisinville
Monroe, MI 48161
313/242-7300
Jayne Herman, Instructor
Flight Education-Credit Ground School (winter only)

NORTHERN MICHIGAN UNIVERSITY
Marquette, MI 49855
906 227-2362
Dr. James Suksi
School of Technology & Science
Airframe Mechanic

NORTHWESTERN MICHIGAN COLLEGE
1701 E. Front Street
Traverse City, MI 49684
616 922-1221
Robert Buttleman, Dept. Head
Basic & Advanced Ground School
Pvt Pilot
Comm. Pilot
Inst. Rating
Multi-Engine Rating
CFI-Airplane
CFI-Instrument
Aviation Flight Tech - A

OAKLAND COMMUNITY COLLEGE
2480 Opdyke Road
Bloomfield Hills, MI 48303
313/884-5395
Julie Marshall
Aviation Flint Tech. — A
Aviation Management — A

SCHOOLCRAFT COLLEGE
18600 Haggerty
Livonia, MI 48152
313/591-6400
Mr. Ronald Griffith
Dean, Continuing Ed.
Basic & Advanced Ground School

SOUTHWESTERN MICHIGAN COLLEGE
Cherry Grove Road
Dowagiac, MI 49047
616/782-5113 Ex 260
Dr. Norman Ashcraft
Dean, School of Tech.
Aviation Maintenance - A
A&P Lic.

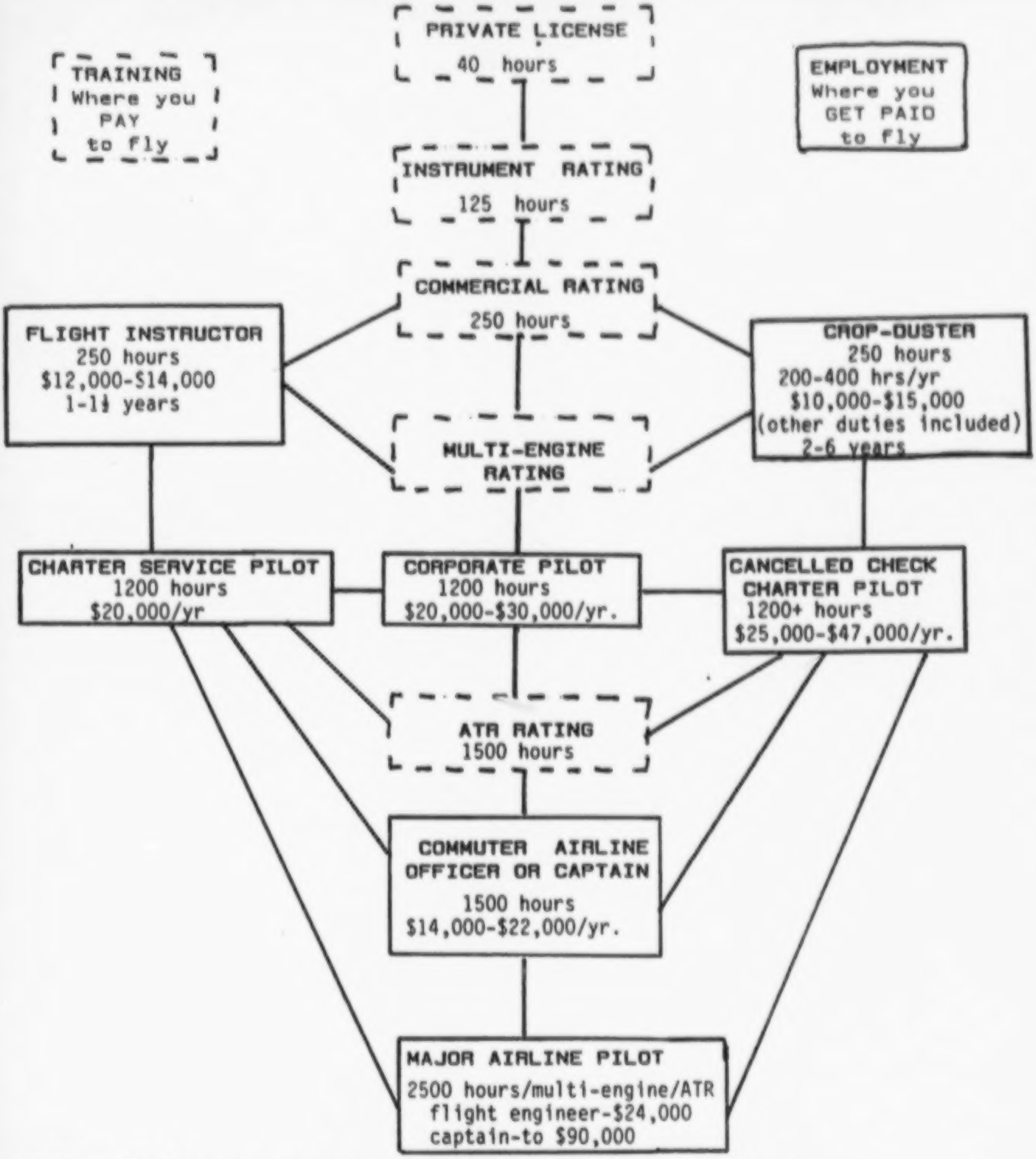
UNIVERSITY OF MICHIGAN
Ann Arbor, MI 48109
313/764-3310
T. C. Adamson, Jr.
Chmn. Dept. Aerospace Engineering
Aerospace Engineering - B, Masters, Doctorate

*** WAYNE COUNTY COMMUNITY COLLEGE**
801 West Fort St.
Detroit, MI 48226

WESTERN MICHIGAN UNIVERSITY
Dept. of Trans. Tech.
West Michigan Avenue
Kalamazoo, MI 48008
Dr. Harley Behm, Chmn.
Dept. of Trans. Tech.
616/387-6515
Ground School-Basic & Advanced
Pvt Pilot
Comm. Pilot
Inst. Rating
CFI-Airplane
CFI-Instrument
Multi-Engine Rating
Aviation Engineering Tech. - B
A/C Tech. - C
Aviation Tech. & Management - B
Prof. Pilot - A/B

* WCCC and MCC offer programs in Aviation Maintenance Tech. through the B. O. Davis Aerospace Center at the Detroit City Airport. For more information contact Ed Rocket (313) 245-3298.

AVIATION CAREER LADDER


TRAINING
Where you PAY to fly
PRIVATE LICENSE
40 hours
EMPLOYMENT
Where you GET PAID to fly
INSTRUMENT RATING
125 hours
COMMERCIAL RATING
250 hours
FLIGHT INSTRUCTOR
250 hours
$12,000-$14,000
1-1½ years
CROP-DUSTER
250 hours
200-400 hrs/yr
$10,000-$15,000
(other duties included)
2-6 years
MULTI-ENGINE RATING
CHARTER SERVICE PILOT
1200 hours
$20,000/yr
CORPORATE PILOT
1200 hours
$20,000-$30,000/yr.
CANCELLED CHECK CHARTER PILOT
1200+ hours
$25,000-$47,000/yr.
ATR RATING
1500 hours
COMMUTER AIRLINE OFFICER OR CAPTAIN
1500 hours
$14,000-$22,000/yr.
MAJOR AIRLINE PILOT
2500 hours/multi-engine/ATR
flight engineer-$24,000
captain-to $90,000

Note: Employment steps can be permanent jobs; not all career pilots end up as airline captains! Job opportunities in agricultural aviation (crop dusting) are greatest in areas such as Florida, Texas, California or third world countries in Africa or South America. © Copyright 1989 by Sky Enterprises, 805 Waverly Ave., Grand Haven, MI 49417 (616) 846-4254.

APPENDIX E

College of Engineering and Applied Sciences
Department of Engineering Technology

Kalamazoo, Michigan 49008-5064
616 387-6515

WESTERN MICHIGAN UNIVERSITY

APPENDIX F

December 13, 1989

Mrs. Betty J. Mattson
805 Waverly Ave.
Grand Haven, MI 49417

Dear Betty:

Good reason for your confusion. But, as you have noticed, our courses are not FAA Test oriented except in a general way.

Students are expected to take the FAA written test in ET 301, ET 303, Commercial I, Commercial II and any other flight course involving a certificate or rating.

We do not instruct for the FAA Test specifically. Students are expected to garner this information from course materials, question books and previous references as may be applicable. The FAA written, while not a prerequisite, becomes a "given" area of student responsibility.

I would expct you may be qualified to teach the ground instruction portion of the flight courses for commercial. Although, these are traditionally taught by flight instructors.

Stop over and see us sometime!

Sincerely,

Ron Sackett

Ron Sackett
Coordinator of Flight Instruction

1

GRAND RAPIDS PRESS SUNDAY, JANUARY 22, 1989

Airlines hire younger fliers to replace the aging corps of pilots

By Carl H. Lavin
The New York Times

Airline executives, concerned about an imminent world shortage of pilots, are taking steps that will place younger and less experienced fliers in command of airliners.

The shortage, most apparent in other countries, is still a few years away in the United States, aviation experts say. But it has already caused a flurry of hiring by American carriers unseen in recent years that points to the coming scarcity.

"Ten years from now every airline in the country will have 30-year-old captains," said Capt. Vern Laursen, vice president for crew training at Trans World Airlines.

The reasons for the threat of a scarcity are numerous: the boom in the civil aviation industry; a soaring retirement rate among an aging corps of pilots, whom the government requires to leave the cockpit at 60; a decline in the number of new students taking up flying, partly a result of costs of basic training that have risen with liability insurance rates, and a lack of growth in the airlines' customary supply of aviators from the military, which has raised pay in an effort to remain more competitive with the carriers.

As a result of all these factors, the pool of experienced American fliers is drying up. "The whole industry's pretty well employed right now," said Ed Muir of the International Air Service Company, which recruits crews for airlines. "It used to be, a large percentage of pilots were unemployed."

The employment boom is such that one-eighth of the 56,000 pilots flying large jets for United States airlines were hired last year. And these airlines expect to hire 32,000 more pilots in the next 10 years, says Future Aviation Professionals of America, a career information service based in Atlanta.

While the notion of 30-year-old captains may sound alarming to a public that has long equated gray hair in the cockpit with safety — two-thirds of major airlines' pilots are over 45 — most executives and other aviation experts contend that a new generation of young pilots is not necessarily a safety threat.

Some even argue that younger, less experienced pilots may be safer than their predecessors, because they have learned fewer bad habits.

These experts caution, however, that the trend toward less experienced pilots means that the new aviators must be trained better from the first day.

Others assert that even the best training is not always an adequate substitute for years of experience in the most demanding cockpit situations, particularly those requiring mastery of an emergency that could lead to an accident.

"If they've got enough training that they are a walking book of knowledge on that airplane, that can make up for experience," said Donald D. Engen, former head of the Federal Aviation Administration. "But when push comes to shove, when everything turns to worms, experience is what really counts."

The pilot hiring boom under way is sending a number of ripples throughout the aviation industry, including these:

- Age, vision, height and weight restrictions that once kept many would-be pilots from the cockpits of major airlines have been loosened. Further, until three years ago most big airlines hired only college graduates; now one newly hired pilot in 10 has no college degree.
- Training programs are expanding, and students with little experience, especially women and members of minority groups, are being recruited to seek careers as pilots.
- The use of flight simulators and other computerized training devices is booming, with civilian and military pilots spending more and more of their training time on the ground.

Some experts say this trend has gone too far, but officials of training programs are ecstatic at the chance to run rapidly through a series of exercises that would be dangerous in an airplane and that can be tailored to individual pilots' weaknesses.

Paying non-pilots to learn how to fly has not caught on yet in the United States, but it is growing overseas, with carriers like Japan Air Lines, Lufthansa and Swissair training new fliers from classroom to cockpit. These carriers' experience may point the way for airlines in the United States.

In October, China Airlines, of Taiwan, sent 11 flight attendants and 13 other workers to the first class of a new flight school in Grand Forks, N.D., run by Northwest Airlines and the University of North Dakota. Gulf Air, of Bahrain is sending eight more students this month. The airlines are paying the $67,000 cost for each student.

Capt. Y.L. Lee, director of training for China Airlines, said that carrier's students would spend 18 months in North Dakota and four more in Taiwan before going to work on 45-minute flights around the island.

Worried that a shortage is near, United and Eastern as well as Northwest have struck deals with universities or colleges to help run aviation programs aimed at producing professional pilots. The FAA and Northwest split the cost of a new $6 million aerospace center on the North Dakota campus.

TWA is going even further. Joining with Flightsafety International, the world's leading pilot training company, the airline plans to open in March a St. Louis-based program to train recent graduates of college aviation programs for careers with airlines.

Laursen, director of training at TWA, said the program would produce 300 fliers a year, each with about 500 hours' experience, to serve as co-pilots for regional lines.

TWA's goal, however, is to help meet its own need for pilots, expected to be about 450 this year.

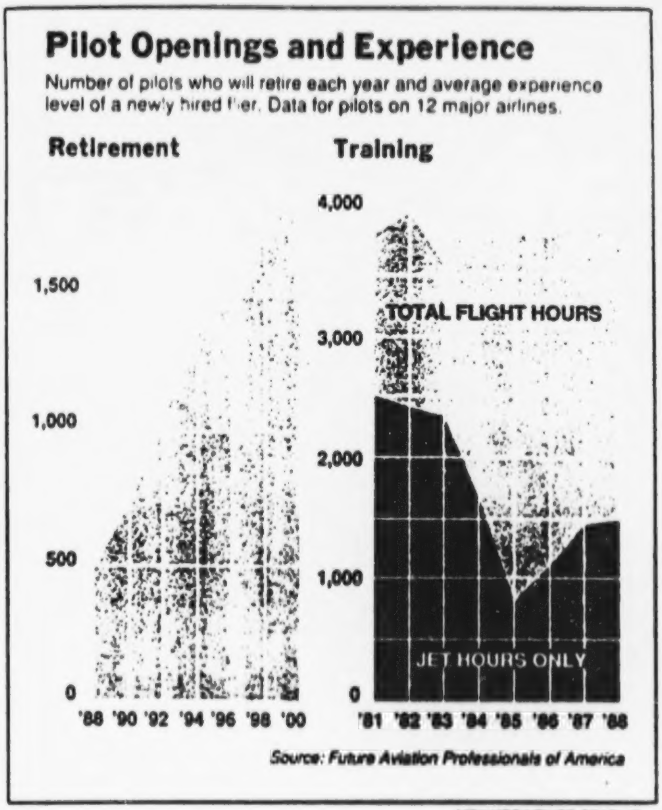
"A number of pilots that graduate from this facility will be hired by TWA," Laursen said. A graduate who goes to work at TWA will be a Boeing 727 flight engineer and can hope to move up the ranks to flight egineer on a Boeing 747, co-pilot on a 727 and then captain on a 727.

Each change requires new training and brings more pay; Laursen said a 22-year-old newly minted flight engineer, whose salary would be $24,000 a year, could expect to make captain in eight years, at about three times that salary. His offer is as close as any American carrier has come to guaranteeing jobs to students, and it has already attracted wide interest.

Some regional lines, where pilot turnover is running around 50 percent a year, have already hired pilots with relatively little flying time.

To ensure that such efforts will be successful, and to address other aspects of rapid turnover among both pilots and managers, the Regional Airline Association in Washington has formed a new study group that is to meet this month.

One such carrier, Atlantic Southeast Airlines, based in suburban Atlanta, has 400 pilots. It usually hires those with at least 1,500 hours of flight time, but its officials feel they may be forced to hire less experienced pilots to fly their 45 planes.



Pilot Openings and Experience

Number of pilots who will retire each year and average experience level of a newly hired flier. Data for pilots on 12 major airlines.

Source: Future Aviation Professionals of America

NEW YORK TIMES GRAPHIC

STUDENT SURGE

GR Press 12-24-89

Grand Valley's growth leads state; JC also doing well

By James Tinney
The Grand Rapids Press

Grand Valley State University again is the state's fastest growing university and Grand Rapids Junior College also is growing faster than the state average.

That's the good news. But officials at both schools don't think they can sustain impressive growth rates for long without more room.

"By the time we hit 12,000 students, which could be as early as next year, we will then have to decide whether or not to have a significant percentage of growth in any year," said Matthew McLogan, vice president for university affairs for Grand Valley.

According to statistics from the State Board of Education, GVSU's enrollment increase of 11.7 percent this fall, to 10,914 students, ranks it as the state's fastest growing university.

Lake Superior State University increased its enrollment by 8.8 percent. Western Michigan University had the third highest growth rate, 5.8 percent.

Enrollment in the state's 15 public universities increased overall by 2.5 percent to a record 255,599, the state board said.

At Grand Rapids Junior College, the state's fifth largest, enrollment increased by 7.1 percent this fall to 11,387 students. Overall, enrollment in Michigan's 29 junior and community colleges increased by 3.3 percent to 224,218 students.

Enrollment at independent colleges and universities also increased, by 3.7 percent to 78,966.

McLogan said GVSU's growth for this year exceeded the university's projections, largely because of an influx of older adult students and transfers.

Population growth in West Michigan also is a big factor, he said.

"You see the people moving into the western part of the state, their kids become part of the universe that tends to go to Grand Valley," said McLogan.

He said 40 percent of high school seniors in Kent, Ottawa and Muskegon counties who go onto four-year colleges attend GVSU.

In response to the university's growth, officials are hoping for legislative approval this year for funding for a new Life Sciences building on the Allendale campus. Next on the district's long-term construction plan is a library and classroom building in downtown Grand Rapids.

At JC, admissions director Richard Austin said the college closed off admissions after the first day of classes this fall. In recent years, JC has allowed applications throughout the first week, he said.

"Classes are filling up earlier. The freshman liberal arts courses are in particularly high demand. We've had to look for classroom space," said Austin.

"The enrollment has gone beyond our wildest projections of a few years ago," he said.

Austin said more classes are being scheduled at less popular hours, especially in the afternoons, to get more use out of available classrooms.

The future growth of the university is being examined by the 53-member committee that is studying whether to establish JC as a countywide community college. If the boundaries of the college's district were expanded beyond Grand Rapids, JC officials say that branch campuses could be built.

Austin said that branch campuses would make access to JC easier for students countywide and would relieve some of the space crunch for JC downtown.

Although problems are accompanying the growth of both colleges, officials aren't complaining.

"There are problems either way (if enrollment increases or decreases), but one is a little more emotionally satisfying than the other," McLogan said.

"If you've got to have problems, this is a nice one to have," Austin said.

Adults flock back to college to fine-tune their work, lives

Newhouse News Serv'

Adults made up 35 percent of college enrollments in 1978, and 39 percent last year.

Jan Wiedrick went from high school to a career in broadcasting without attending college. In 12 years as a radio reporter, she won awards and received prized assignments, such as the city hall beat she now covers for WXXI in Rochester, N.Y.

But last year, after deciding her career needed the benefit of more education, she began taking night classes in communications at nearby Brockport State College.

"Getting a degree will open doors into management," the 31-year-old journalist says. "I've never thought a little piece of paper would make so much difference, after you've proved yourself. But I feel I've been held back because I haven't had a bachelor's degree."

Wiedrick is one of more than 5 million college students over 24 who are giving new meaning to the maxim that learning is — or should be — a life-long experience.

Adults have always been part of the college scene, of course. But in recent years their number has increased dramatically. Last year's adult enrollment of 5,142,000 was up 33 percent from 1978.

Adults made up 35 percent of total enrollments in 1978, and 39 percent last year. Some educators predict adult students will be in the majority by the end of the century, as Baby Boomers age and as the "Baby Bust" generation of the 1970s and 1980s reaches college age.

Research by the College Board and others shows that most adults return to campus during times of transition or crisis — such as following a divorce or separation, death of a spouse, job layoff, move to a new city or when the last child leaves home.

After moving from Ann Arbor, Mich., to Santa Barbara, Calif., where her husband had taken a new teaching job, Marianne Reiff began work on a Ph.D. at the University of California. With a successful career in child development behind her, Reiff, 40, now faces four years of juggling her roles as a mother, wife, wage-earner and student.

"It takes a very supportive spouse, or some kind of support network," Reiff says. "It's very important to not try it alone."

The influx of older students is an outgrowth of several trends. With women entering the labor force in record numbers, many are discovering that in order to achieve career goals, they need to complete degrees that had been interrupted by marriage and child-rearing.

"Many women find they aren't trained or qualified for good jobs," says Peggy Sullivan, director of Purdue University's program for adult students.

The College Board study found that about three of five older learners are women. Sullivan says women tend to resume their schooling in their 30s and 40s, men in their 20s and 30s.

The restructuring of America's labor force, from a manufacturing-based economy to one emphasizing service jobs, also is driving adults back to the books.

"There is not as much job security for the already employed as there used to be," says Morris Keaton, president of the Council for Adult and Experiential Learning, a non-profit group which designs and manages education and retraining programs "to keep employees employable."

Even such bastions of job security as the Bell System is not safe. "Ma Bell used to say, 'Come work for us and you'll have a job for life,'" Keaton says. "Now, none of the Bell companies will guarantee lifetime employment."

Keaton says companies in the auto and telecommunications industries, in conjunction with their unions, have launched retraining programs that include tuition assistance for college-bound workers.

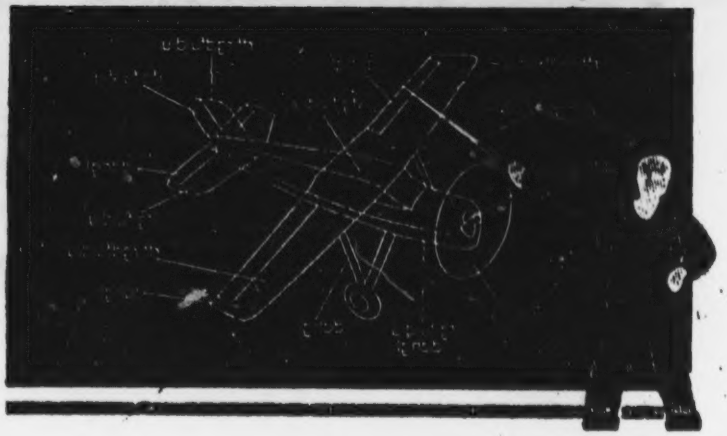
Others return just for the joy of learning. A survey of 3,400 adult women students by the Women's College Coalition found that 57 percent returned to class for personal fulfillment.

"An increasing number of adults think of colleges and universities as filling stations -- you go back every once in a while to fill up the tank," says Douglas Kelley, an adult education specialist at the University of Michigan's Flint campus who received his Ph.D. when he was 53.

Ken Grant, a physician on the faculty of Georgetown University's medical school, is working toward a law degree from Georgetown — but not to practice law.

"My reason for law school is because I saw where medicine is going," he says. "The private practitioner is going to be out of his depth in terms of dealing with insurance companies, HMOs, the federal government. I decided to do it to be at least conversant with law."

With students like this, educators are finding that adults learn differently than younger students, and they have different priorities and needs.



Ex-United execs plan flight school at Kent airport

By Theresa D. McClellan
The Grand Rapids Press

The Kent County Aeronautics Board today was expected to consider a plan by four former United Airlines executives to open a training academy for commercial pilots at Kent County International Airport.

The Aerospace Flight Training Academy plans to buy a small flight school run by Rapid Air while Rapid Air maintains its other services at the airport, said David Koch, managing director of the academy.

Within the year, the academy will spend $5 million making expansions at the airport, said Koch.

"We've been doing flight training for many years, and we couldn't devote the time it needs," said Loretta Vantine, manager of Rapid Air.

The Aerospace Flight Training Academy was begun nearly four years ago by four United Airlines veterans: Percy Wood, retired president of United Airlines; Capt. J.D. Smith, retired UAL vice president of flight safety and industry; Capt. William Rushing, senior UAL DC-10 captain, and Koch, a veteran UAL captain and managing director of the academy.

All but Wood, a Florida resident, are from Illinois, said Koch.

The tenant committee of the Aeronautics Board will recommend the full six-member board approve AFTA entering into an agreement with Rapid Air, said John VanLaar, vice-president of the Aeronautics Board.

Koch said his company chose Kent County because 85 percent of

see FLIGHT, A4

FLIGHT

CONTINUED FROM A1

the nation's pilots come from rural areas and small cities. He described the area as having a "robust business environment."

"Another reason we picked Grand Rapids was for the weather," he said. "We fly in ice and snow and rain and want to train students under those conditions."

The airlines use the jet runways, but two smaller runways for light aircraft will be used by the academy.

"This operation in Grand Rapids is the first of a network of 20 academies across the nation," said Koch, 42, who has been in aviation for 25 years. "It's a business plan, and we are used to accomplishing what we set out to do,"

He said he expects more than half of the current airline pilots to retire by the year 2000. "The traditional civilian pilot training infrastructure has atrophied over the last few years because of demands," said Koch.

He said he and the other former UAL executives formed the academy "to fill a void in the process that our industry has traditionally used in recruiting, screening, training and seasoning new professional pilots."

They will operate from the Rapid Air flight facility and the airport administrative offices and classrooms, said Koch.

Koch said he expects the company to build a 14,000-square-foot academy facility adjacent to the flight facility within a year and spend $5 million over the next 12 months.

"We're buying the existing flight school fleet and will expand to a fleet of 25 planes," he said. "Currently they (Rapid Air) have three planes."

Full-time students will pay about $60,000 each for the 18-month training program.

Students will receive physical, psychological and flight aptitude tests before plunking down the big bucks, Koch said. For those who pass the screening, the $60,000 class is worth it, he said.

"For a person in the mid-20s, career earnings will exceed $4.5 million," Koch estimated.

Aeronautics board member VanLaar said the academy "is a great thing for training of young pilot and it would certainly help the economy at the airport.

"As it grows, it could become a real model for training academies throughout the U.S.," said VanLaar.

"I think we're kinda proud to be chosen first," he said.

AMR, a division of American Airlines, already operates a flight school at the airport.

AMR operates its flight school out of the west side of the airport and also provides charter service, maintenance and aircraft sales, said VanLaar.

But VanLaar described the proposed academy as "a new concept with the extent of training. Normally a student get a license up to a private license. Here with AFTA, you don't graduate until you get 1,500 hours," said VanLaar.

Koch described himself as the only airline pilot to learn to fly the space shuttle. He also was a military pilot and taught hang-gliding.

AFTA currently has three classes — 36 students — enrolled at the airport. Students on the fast track will go from zero flight time to 1,500 hours of flight time in 18 months. For someone doing it part-time, it could take as long as three years, said Koch.

They have three instructors and will expand that to 20 instructors as the student load increases, said Koch.

GR Press 10-13-89

HISTORY

Muskegon College was founded as a proprietary school of business in 1888 by Woodbridge Ferris, the founder of Ferris State University. The school was owned by various individuals and went through several name changes prior to becoming a non-profit institution in 1969. Prominent owners of the College during its proprietary years, in addition to Ferris, included E. C. Bisson, Arthur Howell, and Gail and Robert Jewell. The name of the school also changed several times and was known as Ferris Business College, Muskegon Commercial College, Howell's School of Business, and Muskegon Business College. The present name of Muskegon College was adopted in 1988.

After being located briefly in the Gustin Block on Western Avenue in downtown Muskegon, the school moved several blocks to a location on the corner of Jefferson and Webster where it had its home for many years. In 1957, the school moved to its present location on Apple Avenue by purchasing a former elementary school. Today Muskegon College is a campus of seven buildings, including three residence halls housing 250 students. The latest addition is a new Applied Science Building located along Apple Avenue. In addition to the buildings, there is a recreational area of tennis, basketball, and volleyball courts and a lighted, paved parking area for over 700 cars.

The College was designated as a business school until 1965 when the State of Michigan's Department of Public Instruction authorized the College to grant Associate Degrees. On September 1, 1986, Muskegon College merged with Baker College of Flint and Owosso to form an educational system, which gave Muskegon College the authority to grant the Bachelor of Business Administration Degree.

Muskegon College has always been a leader in business education and was one of the first institutions in Michigan to become a member of and accredited by the Association of Independent Colleges and Schools, the national accrediting agency for business schools and colleges. In 1984, Muskegon College became a member of and was accredited by the Commission on Institutions of Higher Education of the North Central Association of Colleges and Schools, the regional accrediting body for universities and colleges in the Midwest. Accreditation for the Associate Degree was granted in 1984 and for the Bachelor Degree program in 1986.

Muskegon College celebrated its 100th Centennial Anniversary during the Academic Year 1987-88. As the College moves into its second 100 years, the events of the past have provided a solid foundation for the future.

MISSION STATEMENT AND PURPOSE

The mission of the College is to provide practical, quality education and training which enables graduates to work successfully in challenging and rewarding careers. To this end the following Purposes have been established:

1. To prepare the student for business and technical competence.
2. To give the student practical experience and knowledge in a chosen field of study.
3. To encourage social and classroom-related activities which promote the student's personal and professional growth.
4. To provide general education which expands the student's horizons and encourages independent thinking.
5. To assist graduates in developing career opportunities and securing employment.
6. To encourage graduates to continue their education.

From these Purposes the structure and programs of the Institution have been developed.

If you are willing to work and learn, dedicated faculty and staff assure that you can and will succeed in the business at hand — that of getting an education. Muskegon College will do everything possible to help you realize this goal! To achieve its purpose, Muskegon College gives careful attention to:

1. **Initial Enrollment** — Counseling with the students to determine their interests and objectives, aptitudes and resources for obtaining their goals.
2. **Training** — Creating an atmosphere conducive to learning; instructors and counselors who are well trained and have practical experience; modern equipment; physical facilities sufficient to meet demands of the student body; administrative leadership and experience.
3. **Placement** — Proper selection of a job to fit graduates' interests and goals.

AVIATION

AVT 099 SIMULATOR REMEDIATION 1-3

Use of simulator to practice areas where student is weak. May be in any of the flight training areas. As needed, need determined by Chief Flight Instructor.

AVT 100 LAPSED PILOT REFRESHER SEMINAR 1

One day ground school for people who have a private pilot license, but haven't used it recently. Covers current medical requirements, biennial flight review, current airspace regulations, weather briefings, cross country flying techniques, including extensive study of sectional chart usage.

AVT 101 FLIGHT REVIEW 1-3

Review by Chief Flight Instructor of previously obtained instruction. May be of solo, private completion, or other rating completion, if earned at another school. Ground and flight time to be determined as needed for CFI to determine student's competency and suitability for further training.

AVT 102 PRIVATE PILOT GROUND SCHOOL 4

Preparation for the FAA written test. Covers all test areas including aerodynamics, engines, wgt. & balance, performance charts, weather, weather reports, FAR's, E6-B computer, radio navigation, sectional charts, medical factors, cross country flying. Test given in lieu of final exam. Passing the FAA test required to pass the course. T=$15

AVT 103 BEGINNING FLIGHT THRU SOLO 4

Flight Instruction from beginning thru solo. Student must solo to pass the course. All pre-solo areas must be logged and pre-solo written must be passed and copy placed in student's master file. Total flight hours will vary. Some students may receive this instruction from an intern instructor, under guidance of Flight Training Consultant. Pre=AVT 102 (Lab fee $840)

AVT 104 PRIVATE PILOT LICENSE COMPLETION 4

From solo to license completion. Dual flight including 3 hours cross country, 3 hours night, 3 hours check ride prep and other as student needs, and solo flight totaling 20 hours, including 10 hours prescribed cross country flight. Total hours will vary with student. Student must pass FAA check ride to receive credit for the course. Pre=AVT 103 (Lab fee $1465)

AVT 105 INSTRUMENT GROUND SCHOOL 4

Ground school covering all topics to pass the FAA written test for instrument pilots. Students must pass the FAA test to receive credit for the course. T=$20; Pre=AVT 104

AVT 106 BEGINNING INSTRUMENT FLIGHT 3

Flight lessons for the instrument rating. Beginning and may include some additional solo hours as prescribed by flight instructor. Pre=AVT 104 (Lab fee $1985)

AVT 107 INSTRUMENT SIMULATOR INSTRUCTION 2

Continuing instrument instruction, using simulator instead of plane. Instrument areas to be covered determined by flight instructor. This portion may range from 10 to 20 hours total time. Pre=AVT 106 No lab fee.

AVT 108 COMPLETION INSTRUMENT FLIGHT 3

Completing the instrument license, including the FAA check ride. The student must receive the license to pass the course. Note: AVT 106, 107, and 108 may be taken in any combination during the same term, depending on individual student need and progress and with the consent of Flight Training Consultant. Additional hours may have to be logged outside of class to equal the FAA required total of 125 hours. Pre=AVT 106 & AVT 107, may be taken concurrently. (Lab fee $1985)

AVT 201 COMMERCIAL GROUND SCHOOL 4

Ground school to take the FAA written test for commercial pilot. All areas needed will be covered. Passing the FAA written test required to pass the course. T=$20; Pre=AVT 105

AVT 202 COMMERCIAL FLIGHT 4

Flight instruction, including 10 hours dual and 10 hours in high performance aircraft, which may be combined at instructor's discretion; some time may be in simulator, as needed to prepare student to take the FAA flight check for the commercial license. Passing the FAA flight check required to pass the course. Additional solo hours may have to be earned outside the course to equal the total of 250 hours of flight time required to complete the license. These hours should be prescribed by the CFI so the student meets all the specific requirements for the license. Additional hours may be earned during term breaks. Pre=AVT 201 (Lab fee $2830)

AVT 203 FUNDAMENTALS OF INSTRUCTION GROUND SCHOOL 2

Preparation to take the FAA Fundamentals of Instruction written test. This test is required to be taken only once for each person and can then be applied to ground instructor and/or flight instructor ratings. (FAA will waive it for certified public school teachers.) Class may be done on individual basis. T=$20; Pre=PSY 101

AVT 204 GROUND INSTRUCTOR GROUND SCHOOL 3

Prepares student to take the FAA written test for instrument ground instructor. Student may substitute basic or commercial, although instrument is most useful. This rating is required to become a "Gold Seal" flight instructor and all Part 141 flight schools are required to have on staff a certified advanced or instrument ground instructor. May be repeated if necessary for the additional ground instructor ratings. Must pass the FAA test to pass the course. T=$20; Pre=AVT 203

AVT 205 AVIATION HISTORY 4

Aviation history covering well known events and people, such as Wright Brothers, Lindbergh, etc., and aircraft types, changes, and uses through history, also aviation business from air mail through airlines and how this has changed. A written paper and oral presentation will be required. Pre=ENG 101

AVT 206 AVIATION METEOROLOGY 4

Aspects of meteorology that apply to flying including obtaining weather briefings, thunderstorm development, wind shears, jet streams and world weather patterns, climate and others. Pre=AVT 102

AVT 207 MECHANICS FOR PILOTS 4

Course will cover three aspects of aircraft mechanics: What the pilot is legally allowed to do himself; a thorough understanding of what the AirFrame and Powerplant mechanic must do; all the paperwork and record keeping needed to keep a plane legal under the various sections of the FAR's. Will include lab work on planes, as well as classroom, and field trips. Pre=AVT 102

AVT 301 TAILDRAGGER FLIGHT 2
Flight instruction in a taildragger plane. Required of students pursuing a crop dusting tract and recommended for flight instructor students. Flight instruction to a level of competency in a taildragger. Pre=AVT 104 (Lab fee $390)

AVT 302 SEAPLANE FLIGHT 2
Flight instruction needed to obtain the seaplane rating. Must pass the FAA check ride to pass the course. (Lab fee $1500)

AVT 305 FLIGHT INSTRUCTOR GROUND SCHOOL 3
Preparation for FAA written. Passing test is required to pass course. T=$20; Pre=AVT 202 & AVT 203

AVT 306 INSTRUMENT FLIGHT INSTRUCTOR GROUND SCHOOL 3
Preparation for CFII written. Passing the FAA test is required to pass the course. T=$20; Pre=AVT 305

AVT 307 CFI FLIGHT INSTRUCTION 4
Flight instruction for CFI rating. Passing the FAA flight check ride is required to pass the course. (Lab fee $1785)

AVT 308 CFII FLIGHT INSTRUCTION 3
Flight instruction for CFII rating. Passing the FAA flight check is required to pass the course. Pre=AVT 306 & AVT 307 (Lab fee $2830)

AVT 309 AVIATION COMMUNICATION 4
Writing and speaking on aviation topics for both technically knowledgeable audiences and the general public. Two papers and two oral presentations required. Pre=ENG 101 & WRI 104. Required for B.S.

AVT 311 AEROBATIC FLIGHT 1
Dual instruction required for loops, rolls (snap and barrel), hammerhead stalls, aileron rolls. (Lab fee $420)

AVT 401 AVIATION MANAGEMENT 4
Course designed to give students understanding of various types of aviation management: Airports, corporation flying programs, charter flight, other business aspects. An internship should also be pursued. Papers, speakers, and field trips included in course.

AVT 402 MULTI-ENGINE FLIGHT 3
Flight instruction needed to prepare for FAA flight check ride. Passing flight check required to pass course. Dual instruction and solo time in a multi-engine plane as determined by flight instructor. Pre=AVT 104 (Lab fee $2200)

AVT 403 ATR GROUND SCHOOL 4
Ground school to prepare for the FAA Airline Transport Pilot written exam. Passing the written test is required to pass the course. Prerequisite is completion of 1500 flight hours meeting requirements for the rating. T=$20; Pre=AVT 201

AVT 404 ATR FLIGHT TRAINING 4
Flight instruction needed to pass the FAA flight check for airline transport license. Passing the flight check is required for passing the course. Prerequisite: enough hours (1500 total: 50, cross country; 100, night; 75, instrument) and 23 years of age. (Lab fee dependent on student status at beginning of course.)

AVT 110 SMALL AIRPORT INTERNSHIP 1
May be repeated for additional credits. Student will work in a small, non-controlled airport 4 hours per week for one term for one credit. Duties may include: Line person, scheduling planes and instructors, answering phone, clerical duties and maintenance duties.

AVT 111 AVIATION MANAGEMENT INTERNSHIP 2
May be repeated for additional credits. May work in office of corporation, charter service, large airport, or other aviation related business. Duties to be individually arranged.

AVT 112 BEGINNING FLIGHT INSTRUCTOR INTERNSHIP 2
May be repeated. May be in school's own aviation program or in another, under auspices of chief flight instructor there. Will instruct a beginning private or recreational pilot through all steps leading to and including solo. The student must solo in order to receive credit.

AVT 113 FLIGHT INSTRUCTOR INTERNSHIP: ADVANCED PRIVATE 2
May be repeated. Will instruct private or recreational pilot from solo through to license completion. Student must pass the FAA flight check for credit to be earned.

AVT 114 ADVANCED FLIGHT INSTRUCTOR INTERNSHIP 2
CFII may instruct an instrument or commercial flight student. Hours and details to be arranged with school's Flight Training Consultant.

AVT 115 FLIGHT INTERNSHIP 2
May be repeated. Program to be arranged by Flight Training Consultant. Student will serve as co-pilot or pilot. Prerequisite: Commercial license and enough flight hours for the individual situation.

APPENDIX L
PROFESSIONAL PILOT/AVIATION TECHNOLOGY
Associate in Applied Science Degree
6 Quarters

		QUARTER HOURS	TUITION & FEES	
FIRST ACADEMIC YEAR				
Fall			$1,360	
AVT 102	Private Ground School	4		
*AVT 103	Beginning Flight	4	$ 840 lab	
ENG 101	Composition I	4		
MTH 111	Introductory Algebra	4		
		16	$2,200	
Winter			$1,360	
*AVT 104	Completion Private Flight	4	$1,465 lab	
AVT 105	Instrument Ground School	4		
*AVT 106	Beginning Instrument Flight	3	$1,985 lab	
AVT 107	Instrument Simulator	2		
ENG 102	Composition II	4		
		17	$4,810	
Spring			$1,360	
*AVT 108	Instrument Flight Completion	3	$1,985 lab	
AVT 201	Commercial Ground School	4		
AVT 206	Meteorology	4		
PSY 102	General Psychology	4		
		15	$3,345	
	TOTAL FIRST YEAR			$10,355
SECOND ACADEMIC YEAR - FLIGHT INSTRUCTOR TRACT				
Fall			$1,360	
*AVT 202	Commercial Flight	4	$2,830 lab	
AVT 203	Fundamental of Instruction	1		
AVT 207	Mechanics for Pilots	4		
CIS 101	Intro to Computers	4		
WRI 104	Technical Writing	4		
		17	$4,190	
Winter			$1,360	
AVT 305	CFI Ground School	3		
*AVT 307	CFI Flight Training	4	$1,785 lab	
GEO 101	Western Geography	4		
POL 201	Political Science	4		
AVT 110	Internship (or 115 or another 204)	2		
		17	$3,145	
Spring			$1,360	
AVT 309	Aviation Communication	4		
MGT 101	Intro to Business	4		
SPK 201	Oral Communication	4		
WRK 205	Employment Seminar	1		
AVT 306	CFII Ground School and	3		
	*AVT 308 CFII Flight Training	4	$1,470 lab	
		20	$2,830	
	TOTAL SECOND YEAR			$10,165
Total Quarter Hours		102		

*These course may require additional hours depending on student's progress. Additional hours are $40-60 per hour.

APPENDIX M (1 of 2)

BACHELOR OF SCIENCE DEGREE PROGRAM

Aviation Management Major

The Bachelor of Science degree in Aviation Management is designed for the individual who is seeking to gain entry or increase his/her opportunities for promotion in professional aviation or aviation management.

In combination with management and general education courses, the student will complete commercial pilot requirements and additional specialized aviation training. Long-range employment opportunities for aviation professionals are excellent and increasing steadily.

BACHELOR OF SCIENCE IN AVIATION MANAGEMENT DEGREE

All Aviation Management students must complete the following requirements for the Bachelor of Science degree:

General Education Core Requirements	48 hours
Aviation Management Core Requirements	48 hours
Aviation Technology Major Requirements	48 hours
One Minor: Liberal Arts or Business	24 hours
Aviation Specialty Minor	24 hours
Aviation Internship	4 hours
Employment Seminar	1 hour
	197 hours

GENERAL EDUCATION CORE

Same as for Industrial Management, take from page 38 of catalog.

LIBERAL ARTS

Same as for Industrial Management, take from page 38 of catalog.

BUSINESS MINORS

Same as other Bachelor Degree Minors, take from pages 40 and 41.

AVIATION MANAGEMENT CORE

This is required of all majors. It consists of 48 credit hours. The courses are:

ACC 101	Principles of Accounting I	4
ACC 102	Principles of Accounting II	4
ACC 103	Principles of Accounting III	4
FIN 301	Principles of Finance	4
MGT 101	Introduction to Business	4
MGT 201	Personnel Management or MGT 202 Management & Supervision	4
MGT 203	Management Seminar	4
MGT 301	Organizational Behavior	4
MGT 401	Labor-Management Relations	4
MGT 402	Quantitative Methods of Management	4

AVT 401	Aviation Management	4	
WRI 104	Technical Communication	4	

AVIATION TECHNOLOGY MAJOR CONCENTRATION

AVT 102	Private Pilot Ground School	4	
AVT 103	Beginning Flight	4	lab # 840
AVT 104	Private License Completion	4	lab #1465
AVT 105	Instrument Ground School	4	
AVT 106	Beginning Instrument Flight	3	lab #1985
AVT 107	Instrument Simulator Instruction	2	
AVT 108	Instrument Rating Completion	3	lab #1985
AVT 201	Commercial Ground School	4	
AVT 202	Commercial Flight	4	lab #2830
AVT 205	Aviation History	4	
AVT 206	Aviation Meteorology	4	
AVT 207	Mechanics for Pilots	4	
AVT 309	Aviation Communication	4	
		48	lab #9105

AVIATION SPECIALTY MINOR

Students will take 24 credits of additional aviation classes. They will prepare to become certified flight instructors. As such they may begin building hours necessary for any advanced ratings they may choose while they instruct student pilots through the private, commercial, instrument and multi-engine phases of their flight training.

BACHELOR DEGREE MINORS

Aviation Minor

(24 credit hours, 8 courses)

Course Number		Quarter Hours	
AVT 203	Fundamentals of Instruction Ground School	2	
AVT 204	Ground Instructor Ground School	3	
AVT 305	Flight Instructor Ground School	3	
AVT 306	Instrument Flight Instructor Ground School	3	
AVT 307	CFI Flight Instruction	4	lab #1785
AVT 402	Multi-engine Flight Rating	3	lab #2200
AVT 301	Taildragger Flight Rating	3	lab # 390
AVT 308	CFII Flight Instruction	3	lab #1470
			lab #5845

Note: This minor makes a person a certified flight instructor and multi-engine pilot.

APPENDIX N

BACHELOR DEGREE MINORS

Aviation Minor

(24 credit hours, 7 courses)

Course Number		Quarter Hours
AVT 102	Private Pilot Ground School	4
AVT 103	Beginning Flight	4
AVT 104	Private License Completion	4
AVT 105	Instrument Ground School	4
AVT 106	Beginning Instrument Flight	3
AVT 107	Instrument Simulator Instruction	2
AVT 108	Instrument Flight Completion	3
		24

Note: This minor makes a person an instrument rated private pilot. Such pilots may fly on business, if flight is "incidental to that business." They may not charge passengers, however they may "split expenses" with passengers or fly co-workers in a plane owned or rented by their employers. I.e. several employees could fly to another city for a business meeting, or the pilot-salesman could fly himself around on sales calls to different cities.

APPENDIX O (1 of 2)

AVIATION PROGRAM PHILOSOPHIES
(Students/Instructors)

COMPETENT PILOTS

Safety First! Students will learn the "attitude" for safety, as well as the skills needed to operate equipment in a safe manner, and be able to follow all regulations that further this.

Skill Building. Students will master a skill before moving on. If remediation is needed and more hours than required by regulation must be logged to attain a competent skill level, that will be done. Students will not be "signed off" until they have mastered a task, even if additional expenses (i.e. flight time, individual instruction time) are required.

Flexibility. Every effort has been made to design flexibility into the program. Previously earned ratings or logged flight time are allowed as long as competency is proven. (MCBT credit, however, is given only for flight or exams officially taken at MCBT or transferred in from an acredited school) Some hours in addition to those needed for courses will have to be logged. School planes will be available to rent at the regular student rate for this, however students are welcome to fly elsewhere and will be encouraged to become "checked out" in as many different types of aircraft as they wish. Both flight instructor and crop duster "tracts" or specialties are offered. Also offered are seaplane, taildragger, and aerobatic flight, as well as multi-engine.

RESPONSIBILITY

Regulations. Thru all courses, the Federal Aviation Regulations will be studied. Airman's Information Manual and FAR's will be used as texts and continuing students will be required to have a current copy each year and know how to research any question on regulation that comes up.

Record Keeping. In the first orientation session, students will learn how to keep a pilot log and beyond this, how to keep accurate records of all their aviation related activities. The "master file" the school will maintain on every student will contain a copy of each written test result report, the pre-solo written test administered by the flight instructor, and a master "break-down" log of flight time, so calculations of pilot-in-command, nite flight, cross country flight, etc. will be possible when determining if requirements for advanced ratings (i.e. commercial, ATR) have been met. The same skills would be applied to aircraft maintenance records.

Personal. Students will be encouraged to be dependable and punctual, as much as is possible with considerations to safety, weather, etc.

OTHER SKILLS

Business. Students will understand that aviation as a career is a business, and will have an opportunity to develop skills in that area.

People Skills. Courses in psychology will be included, but mainly thru internships, students will learn and practice their "people skills" in developing responsible, courteous attitudes in working with people, customers, passengers and students, many of whom may be in "crisis" situations and hence, not always courteous in return. They will also understand they may have to clean the lounge, gas the plane, serve coffee, and carry luggage at various stages of their careers. It is also usually necessary to work long, erratic hours, including nights and weekends, especially as charter pilots in emergency situations.

Writing/Speaking. Courses in general writing and technical writing will be included. Students will be able to write an accident report or business letter. They will also be able to organize and present thoughts on aviation topics, both in writing and speaking, to individuals and groups. One of the differences between a degreed pilot and a non-degreed pilot is this extra "polish".

THE MUSKEGON COLLEGE 2 + 2 SYSTEM

The Muskegon College 2 + 2 system leading to the Bachelor of Business Administration or Bachelor of Science Degree is an effective degree completion strategy. It is a significantly different and more beneficial approach than most other college programs.

2 + 2 = More Than a Slogan

The course requirements are substantially the same in both traditional and 2 + 2 degree methods. The difference, however, is the point when course work in the students' majors is offered. With the Muskegon College 2 + 2 system, students begin required courses in their major while completing the associate degree. In this way, enthusiasm for degree completion is maintained. Students interested in Business Administration, for example, are motivated by experiencing computer, management, and marketing courses early in their program. The Muskegon College 2 + 2 system offers major course work immediately, providing a meaningful, highly marketable associate degree.

Muskegon College's emphasis is on degree completion. Students are encouraged to progress toward completing requirements for graduation. During the junior and senior years of the 2 + 2 program, the student completes a major and minor while finishing the important liberal arts requirement. Many students are also employed during this period. Work experiences give greater meaning to the liberal arts course work, since career-minded students can better understand the importance of achieving a well-balanced education.

In summary, the 2 + 2 system provides the opportunity to complete a significant portion of the degree major while finishing the associate degree — all during the first two years! The 2 + 2 system increases enthusiasm for completing the bachelor degree, provides faster employment readiness, and makes the third and fourth year studies more meaningful.

Consider the Muskegon College 2 + 2 system for a Bachelor of Business Administration or Bachelor of Science Degree.............a better way!

ASSOCIATE DEGREE STUDENTS

Entering freshmen pursuing an associate degree will find a wide selection of business and technical programs designed for direct application to the job market. This catalog has a comprehensive list of Muskegon College offerings.

THE 2 + 2 SYSTEM FOR FRESHMEN STUDENTS

Freshmen entering Muskegon College who desire a Muskegon 2 + 2 system bachelor degree begin by enrolling in an associate degree program. Most associate degree programs lead to a related bachelor degree program. Following completion of the associate degree, two options are available to the student.

1. To enter a bachelor degree program as a full-time student.
2. To begin full-time employment and continue the BBA degree as a part-time student.

THE 2 + 2 SYSTEM FOR TRANSFER STUDENTS

Muskegon College is eager to assist transfer students who choose to enter the Bachelor of Business Administration program. Transfer students must first request official transcripts from high school and all colleges attended for evaluation by the Registrar. Financial aid transcripts will also be required of those students applying for financial assistance. Transfer students should become familiar with the Muskegon College acceptance of transfer credit policy. They will find Muskegon College is committed to apply its acceptance of transfer credit policy for maximum transfer of credit. The number of credits accepted by Muskegon College will determine entry at the associate or bachelor-degree level.

CURRENT YEAR
GRADUATES AND
EMPLOYERS
MUSKEGON
COLLEGE

SLIDE PRESENTATIONS
EDUCATIONAL PROGRAMS
aviation -- nature

SKY ENTERPRISES

805 Waverly Ave.
Grand Haven, MI 49417
(616) 846-4254

AVIATION EDUCATION NEEDS SURVEY

Name ______________________________ Grade ____________

Address ____

City ______________________ phone ____________________

School Attending _____________________________________

Do you know much about careers in aviation? Yes No

What type of aviation career interests you? (circle 1 or more)

Air Traffic Controller Corporate Pilot Crop Dusting

Charter Pilot Flight Instructor Airline Pilot Military Pilot

Missionary Pilot Other: ______________________________

Would you go away to college for aviation? YES NO

Which of these locations would you consider? (They currently have schools offering flight programs)

Kalamazoo Lansing Traverse City Jackson Ypsilanti

Out of State: Indiana Illinois Ohio Other: ______________

If a college aviation program were offered in west MIchigan, where would you prefer it to be held?

Grand Rapids Muskegon Holland Grand Haven

Which type of program would you want?

Associate Degree (2 year) career pilot ______________
Bachelor's Degree (4 year) with sales or business emphasis ______________
Bachelor's Degree (4 year) with engineering emphasis ______________
Other: (please specify) ______________________________

When would you want to start such a program? (Specify year) ____________

Aviation training is very expensive. Aircraft rental and instructor fees usually range from $10,000 to $12,000 altogether, plus school tuition and other expenses. Scholarships and grants for the flight fees are not readily available. Knowing this, **Are you still interested in pursing a college degree in aviation?** YES NO

Do you want to be added to a mailing list to receive info on any upcoming aviation education classes or opportunities? YES NO

APPENDIX Q

SLIDE PRESENTATIONS
EDUCATIONAL PROGRAMS
aviation -- nature

SKY ENTERPRISES

805 Waverly Ave.
Grand Haven, MI 49417
(616) 846-4254

APPENDIX R

"The jobs are coming. There's going to be a shortage!" States Mary Creason of Grand Haven, former Administrator with the Michigan Aeronautics Commission. She's referring to professional pilot, aircraft mechanic and avionics positions.

A possibility exists for developing both an associate degree and bachelor degree level program in the Muskegon area to train professional pilots and aviation managers. Evidence that the job openings will be there for graduates abounds. But evidence of potential students in this geographical area is also needed.

To this end, I need YOUR help!!! If you could offer the enclosed questionnaire to your student body, thru student bulletins or PA announcements, and have any who might be interested in learning more about a possible future career in aviation fill out the questionnaire, we will be able to build a base line of data on this phase of the project.

I will contact you in a couple of weeks to see if you have been able to have any filled out and make arrangements to pick them up from you. The plan is to schedule public follow-up meetings in several area cities next winter and spring. Meantime, if you have questions, comments, or feedback, I can be reached at the above number.

Thanx for your cooperation on researching this project that may improve educational opportunities for your students.

Sincerely,

Betty J. Mattson

APPENDIX S

WEST MICHIGAN AIRPORTS

Allegan: Padgham Field
Coopersville: Coopersville Airport PV
Fremont: Fremont Municipal Airport
Grand Haven: Memorial Airpark
Greenville: Greenville Municipal Airport
Hart-Shelby: Oceana County Airport
Hastings: Hastings City/Barry County
Holland: Tulip City Airport PV
Ionia: Ionia County Airport
Jenison: Riverview Airport PV
Ludington: Mason County Airport
Newaygo: Newaygo City Airport
Nunica: Jablonski Airport PV
Plainwell: Otsego-Plainwell Municipal Airport
South Haven: South Haven Area Regional Airport
Sparta: Sparta Airport Commission
White Cloud: White Cloud Airport
Note: Class D airports are not included

These airports will be invited to "host" free public information meetings on "Aviation Careers", which will generate students for the MCBT program and some non-college potential student pilots for them. They will also be invited to provide "internship sites" for student interns in small airport management.

WEST MICHIGAN COMPANIES UTILIZING AVIATION

The following is a partial list of West Michigan corporations and businesses which either have their own corporate aircraft or use charter service in their businesses: Guardsman, Mazda, Haworth, Donnelly, Herman Miller, Steelcase, Prince, Grand Haven Stamped Products, Kurdziel Iron & Metal Works, Sealed Power, Teledyne, Homet, Zelenda Nursery, Broward Marine, Trendway, S-2 Yachts, Jetaway Air Service, Bilmar Foods, Gerber Baby Products.

These and other similar businesses could be tapped into for: Input into the curriculum and later interviewing for hire MCBT aviation graduates (we could lay the ground work now); for a "job bank" of part time and seasonal jobs to help our students earn money; for endorsements of the concept of using aviation in business to be used on brochures and advertisements; scholarships for flight fees for students; donations of money and/or equipment to the college for use in the aviation program (some of them probably donate to colleges anyway).

SLIDE PRESENTATIONS
EDUCATIONAL PROGRAMS
aviation -- nature

SKY ENTERPRISES

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Grand Haven, MI 49417
(616) 846-4254

APPENDIX T

ADVISORY BOARD QUESTIONNAIRE

NAME ______________________________

BUSINESS ADDRESS ______________________________

____

PHONE(S) ______________________________

HOME ADDRESS: ______________________________

____

HOME PHONE(S) ______________________________

I prefer to be contacted: at home at work by mail by phone
(please circle any that apply to you)

Amount of time you can donate to the project in a month:

Attending Meetings ______________________________

Reading, researching, or writing curriculum ______________________________

The best time for me to attend a meeting would be:

Days evenings weekends best weeknite: ______________

My special area of interest and/or expertise is: ______________

____

____

I AM AM NOT willing to have my name used in brochures and publicity on the development of this college aviation program.

FAA RATINGS HELD (Be sure to include all ratings, ground instructor, mechanic, etc. as well as pilot ratings) ______________

____

____

COMMENTS AND SUGGESTIONS: (Continue on reverse side if needed) ____

____

R/11/89 ______________________________

SLIDE PRESENTATIONS
EDUCATIONAL PROGRAMS
aviation -- nature

SKY ENTERPRISES

805 Waverly Ave.
Grand Haven, MI 49417
(616) 846-4254 .

AVIATION EMPLOYER QUESTIONNAIRE

Business Name ______________________________

Mailing address: ______________________________

____

Phone(S) ______________________________

Manager: ______________________________

Number and types of aircraft owned or operated by your organization:

____

____

____

Number of pilots, mechanics, other aviation professional employed by y (please indicate ratings and full time/part time) ____________

____

____

Other duties these people also fill: ______________________________

____

We hire ____________ new pilots every ____________ years (on average)

Ratings and number of hours we require: ______________________________

____

We plan to hire ____________ pilots in the next 2--4 years

Strengths we look for in hiring pilots: ______________________________

____

____

Weaknesses we screen pilots out because of: ______________________________

____

____

Type of aviation training we prefer in pilots we choose to interview:

College Associate's Degree College Bachelor's Degree

Local Flight School National Flight School (such as Spartan)

Other ______________________________

Please circle any that apply. Please add any additional comments or longer answers on back or another sheet of paper. Thank You!!

APPENDIX U

BEYOND the private pilot license

STUDENT PILOT Certificate

- 16 years of age
- 3rd Class Medical Certificate
- Specific maneuvers which are logged
- Pre-solo written test

RECREATIONAL PILOT Certificate

- 17 years of age
- 3rd Class Medical Certificate
- 15 hrs. dual instruction
  - 2 hrs. outside local area
  - 3 landings more than 25 NM
  - 2 hrs. preparation for flight check
  - Specific maneuvers which are logged
  - Pre-solo written test
- 15 hrs. solo flight
- FAA written test of 50 questions
- FAA flight check ride

PRIVATE PILOT Certificate

- 17 years of age
- 3rd Class Medical Certificate
- 20 hrs. dual instruction
  - Specific maneuvers which are logged
  - Pre-solo written test
  - 3 hrs. cross country
  - 3 hrs. night
  - 3 hrs. preparation for flight check
- 20 hrs. solo flight time
  - 10 hrs. cross country (more than 50 NM)
  - 3 landings at airport with ATC
- FAA written test of 50 questions
- FAA Flight check ride (44 tasks)

INSTRUMENT Rating Requirements

- Hold at least a private certificate
- 3rd Class Medical Certificate
- 125 hrs. total time
  - 50 hrs. to airports over 50 NM from departure point as a private pilot
  - 40 hrs. of instrument time, up to 20 hrs. may be in simulator
  - 15 hrs. instrument instruction by CFII, 10 may be in simulator
- FAA written test of 60 questions
- FAA flight check ride (24 tasks)

COMMERCIAL PILOT Certificate

- 18 years of age
- 2nd Class Medical Certificate
- 250 hrs. total time (not over 50 hrs. in simulator)
- Instrument rating
- 50 hrs. dual instruction (includes 20 hrs. for private & 15 hrs. for instrument)
- 10 hrs. dual instruction for Commercial
  - retractable landing gear, flaps, & controllable-pitch propeller
- FAA written test of 100 questions
- FAA Flight check ride (34 tasks)

CERTIFICATED FLIGHT INSTRUCTOR Certificate

- 18 years of age
- 2nd Class Medical Certificate
- Hold commercial (or ATP) certificate & instrument rating
- FAA Fundamentals of Instructing written test of 50 questions
  - May be waived for certified public school teachers
  - Don't have to re-take this test for future instructor ratings
- FAA flight instructor written test of 100 questions
- FAA Flight check ride (16 tasks from a possible 67 tasks)
- Must be renewed every 2 years

GROUND INSTRUCTOR Certificates (Basic, Instrument, Advanced)

- No flight experience or certificate required
- 18 years of age
- FAA Fundamentals of Instructing written test of 50 questions
- FAA Ground Instructor written test of 100 questions for each level
- This rating required to be a "Gold Seal" flight instructor

CERTIFICATED FLIGHT INSTRUCTOR INSTRUMENT Certificate

- Be a CFI
- Have 15 hrs. pilot-in-command time
- FAA written test of 50 questions
- FAA Flight check ride (8 tasks from a possible 38)

AIRLINE TRANSPORT PILOT Certificate

- 23 years of age
- High Schol diploma
- 1st Class Medical Certificate
- 1,500 hrs. of flight time
  - 500 hrs. of cross-country time
  - 100 hrs. of night flight time
  - 75 hrs. of instrument time
- FAA written test of 100 questions
- FAA Flight check ride of 31 tasks

SEAPLANE Rating

- No written test for add-on rating
- No minimum hours of flight instruction
- CFI sign-off on necessary instruction & competence
- FAA Flight check ride
  - 34 tasks if added to private certificate
  - 31 tasks if added to commercial certificate

MULTI-ENGINE Rating

- No written test for add-on rating
- No minimum hours of flight instruction
- CFI sign-off on necessary instruction and competence
- FAA Flight check ride
  - 34 tasks if added to private certificate
  - 31 tasks if added to commercial certificate

Note: You must be able to read, speak, and understand the English language to hold any pilot rating.

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(616) 846-4254.

March 16, 1990

MEMO TO: ROGER MILLER

FROM: BETTY MATTSON

RE: PROPOSED AVIATION CURRICULUM CHANGES RATIONALE

I am proposing that AVT 203 (FOI) be 1 credit instead of 2
that AVT 204 and AVT 306 be 2 credits instead of 3
This was my original plan, however Gary & Greg changed it when they wanted more credits for the aviation minor. I want to put it back and re-arrange the aviation major and minor to accommodate this and keep a total of 72 hours for the following reasons: # of contact hours required for these classes does not justify the additional credits; the FAA written test questions they are asked are often "repeats" of questions they have already had on previous tests. I would like to keep the Fundamentals of Instructing separate from the technical portion because they both require a test and it gives greater flexibility in choice of CFI or ground instructor rating.

I would like to change the general ed requirements for the BBA to those listed on an attached sheet, rather than those in your current catalog. The reasons for this are to make them match the AAS general ed and fit the 2 + 2 position; mandate less math and physics for those students unable to handle them; (they are helpful, but many good pilots don't have them) offer chemistry as an option, which will be needed by future crop dusting people; give the option of emphasis on speaking if that is a strength since many controllers and others are called on to do this; give greater flexibility for transfer students with general ed from other schools and greater flexibility in choosing classes to fit into a schedule (i.e. if one doesn't fit, the student may opt for another).

Break down and increase flight hours on the Commercial Flight to add more. Other schools combine instrument and commercial. NWC has 4-4 credit terms for a total of 16 term credits. WMU has 3-3 semesters for a total of 9 semester hours. Neither offers the option of getting just the instrument rating. By keeping them seperate, as we have proposed, a BBA major can get a minor with a private license with instrument rating and no commercial. This is potentially very useful in business flying. No other school offers this! By increasing the commercial hours to 7, we will have a total of 15 term credits for the combined commercial and instrument, which seems to be competitive. Also a professional pilot student might sequence the courses differently, i.e. beginning commercial, beginning, instrument, then the two simulators, etc. I discussed these changes briefly with Gary and he concurs. Originally we hadn't planned to include all the hours needed, but it was thought that if they were included, it would be easier for the students to budget their lab fees, etc. Simulator hours have been calculated in by Gary and Greg to meet this total. This is within the legal limits of the FAA requirements and we still use fewer simulator hours than many other schools!

PROPOSED NEW COURSE DESCRIPTIONS OF 3-16-90

AVT 203 FUNDAMENTALS OF INSTRUCTION GROUND SCHOOL 1
Preparation to take the FAA Fundamentals of Instruction written test. This test is required to be taken only once for each person and can then be applied to ground instructor and/or flight instructor ratings. (FAA will waive it for certified public school teachers.) Taught in Instruction Seminar Format. T=$20; Pre + PSY 101 (or 102)

AVT 204 GROUND INSTRUCTOR GROUND SCHOOL 2
Prepares student to take the FAA written test for instrument ground instructor. May be taken more than once: for Basic, Instrument or Advanced GI ratings. This rating is required to become a "Gold Seal" flight instructor and all Part 141 flight schools are required to have on staff a certificated advanced or instrument ground instructor. Must pass the FAA test to pass the course. T=$20; Pre= AVT 203 (or concurrent)

AVT 306 INSTRUMENT FLIGHT INSTRUCTOR GROUND SCHOOL 2
Preparation for CFII written. Passing the FAA test is required to pass the course. T=$20; Pre= AVT 305

COMMERCIAL FLIGHT INSTRUCTION will be changed from current AVT 202 to 3 classes listed thus:

AVT 202 COMMERCIAL FLIGHT BEGINNING 2
Beginning commercial maneuvers instruction. (May include some "safety pilot" time)

AVT 208 COMMERCIAL SIMULATOR FLIGHT 2
Simulator instruction and solo hours in commercial flight procedures.

AVT 209 COMMERCIAL FLIGHT COMPLETION 3
Completion of dual and solo, including 10 hours dual in high performance aircraft and preparation for commercial flight check ride. Must pass check ride to pass the course. Must have completed 250 hours total time to take check ride. May include some "safety Pilot" time. (Total lab fees for AVT 202, 208 and 208 = $2830.)

PROPOSED NEW AAS ROTATION

FIRST ACADEMIC YEAR

Fall

AVT 102	Private Ground School	4
AVT 103	Beginning Flight	4
ENG 101	Composition	4
MTH 111	Introductory Algebra	4
		16

Winter

AVT 104	Completion Private Pilot	4
AVT 105	Instrument Ground School	4
AVT 106	Beginning Instrument Flight	3
AVT 107	Instrument Simulator	2
ENG 102	Composition II	4
		17

Spring

AVT 108	Instrument Flight Completion	3
AVT 201	Commercial Ground School	4
AVT 206	Meteorology	4
PSY 101	Human Relations	4
AVT 202	Beginning Commercial flight	2
		17

SECOND ACADEMIC YEAR

Fall

AVT 208	Commercial Simulator	2
AVT 209	Commercial Completion	3
AVT 203	FOI	1
AVT 207	Mechanics for Pilots	4
CIS 101	Intro to Computers	4
WRI 104	Technical Writing	4
		18

Winter

AVT 305	CFI Ground School	3
AVT 307	CFI Flight	4
GEO 101	Western Geography	4
POL 201	Political Science	4
AVT 110	Internship	2
		17

Spring

AVT 309	Aviation Communication	4
MGT 101	Intro to Business	4
SPK 201	Oral Communication	4
WRK 205	Employment Seminar	1
AVT 306	CFII Ground School	2
AVT 308	CFII Flight Training	4
		19

Total quarter Hours 104

APPENDIX W Pg. 3 of 5

PROPOSED GENERAL EDUCATION CORE FOR AVIATION

(See attached memo for rationale of changes from General Education Core list on page 38 of the catalog)

ENG 101	Composition I	4
ENG 102	Composition II	4
MTH 111	Introductory Algebra	4
PSY 101	Human Relations	4
PSY 102	General Psychology	4
SOC 201	Sociology	4
SPK 201	Oral Communication	4
POL 201	Political Science	4
GEO 101	Western Geography	4

And remainder of credits to equal a total of 48 to be chosen from: MTH 121, Intermediate Algebra; MTH 124, Trigonometry; MTH 302, Statistical Methods; SCI 201, Physics I; SCI 202 Physics II; GEO 102, Third World Geography; POL 401, International Relations; SCI 204, Basic Chemistry; PSY 401, Social Psychology; SPK 202, Group Dynamics; SPK 401, Presentational Speaking; SPK 402, Argumentation and Debate.

(Students may choose a diverse variety, or concentrate in speech, psychology, science, etc. May not use same course for general ed as is used in a minor)

PROPOSED AVIATION MAJOR FOR BBA

(This is to replace "Aviation Technology Major Concentration and Aviation Minor and combine into one section equaling 72 credits. The student will only complete one other minor. See attached memo for rationale)

AVT 102	Private Pilot Ground School	4
AVT 103	Beginning Flight	4
AVT 104	Private License Completion	4
AVT 105	Instrument Ground School	4
AVT 106	Beginning Instrument Flight	3
AVT 107	Instrument Simulator Instruction	2
AVT 108	Instrument Rating Completion	3
AVT 201	Commercial Ground School	4
AVT 202	Commercial Flight Beginning	2
AVT 208	Commercial Flight Simulator Procedures	2
AVT 209	Commercial Flight Completion	3
AVT 205	Aviation History	4
AVT 206	Aviation Meteorology	4
AVT 207	Mechanics for Pilots	4
AVT 309	Aviation Communication	4
AVT 203	FOI Ground School	1
AVT 204	Ground Instructor Ground School	2
AVT 305	Flight Instructor Ground School	3
AVT 306	CFII Ground School	2
AVT 307	CFI Flight Instruction	4
AVT 402	Multi-engine Flight Rating	3
AVT 301	Taildragger Flight Rating	3
AVT 308	CFII Flight Instruction	3
Total Aviation Credits		72